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NC 49
FROM THE EXISTING FOUR LANE SECTION NEAR UNCC
TO APPROXIMATELY 1000 FEET EAST OF SR 1300 IN HARRISBURG
MECKLENBURG AND CABARRUS COUNTIES
FEDERAL-AID PROJECT NO. F-28-1(4)
STATE PROJECT NO. 8.1672601
T.I.P. NO. R-2215

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ADMINISTRATIVE ACTION ENVIRONMENTAL ASSESSMENT

U.S. Department of Transportation
Federal Highway Administration
and
N.C. Department of Transportation
Submitted pursuant to 42 USC 4332(2)(c)

6/5/91 H. Franklin Vick
Date for L. J. Ward, P.E.
Manager of Planning and Environmental Branch
NCDOT

6/17/91 Roy C Shelton
Date FOR Nicholas L. Graf, P.E.
Division Administrator
FHWA

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ADMINISTRATIVE ACTION ENVIRONMENTAL ASSESSMENT

JUNE 1991

DOCUMENTATION PREPARED BY

PRESNELL ASSOCIATES INC/PAI ASSOCIATES

Ronald C. Smith
Ronald C. Smith, P.E.
Project Manager

NORTH CAROLINA
PROFESSIONAL
SEAL
13690
ENGINEER
RONALD C. SMITH

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NC 49

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SUMMARY

Summary

Environmental Assessment
Prepared by the
Planning and Environmental Branch
of the
North Carolina Department of Transportation
in consultation with the
Federal Highway Administration

1. Type of Action

Federal Highway Administration Action, Environmental Assessment.

2. Additional Information

The following individuals can be contacted for additional information concerning this Environmental Assessment:

Mr. Nicholas L. Graf, P.E.
Division Administrator
Federal Highway Administration
310 New Bern Avenue
Post Office Box 26806
Raleigh, North Carolina 27611
Telephone: (919) 856-4350

Mr. L.J. Ward, P.E., Manager
Planning and Environmental Branch
Division of Highways
Highway Building
Post Office Box 25201
Raleigh, North Carolina 27611
Telephone: (919) 733-3141

3. Action required by other Federal Agencies

Application for a general permit from the U.S. Army Corps of Engineers will be required for this project. The project is expected to qualify for a nationwide permit under activity number 14 of Section 404 of the Clean Water Act of 1977.

4. Description of Action

The North Carolina Department of Transportation (NCDOT) proposes to widen NC 49 from the existing four-lane section near the University of North Carolina at Charlotte (UNCC) in northeast Mecklenburg County to a point approximately 1,000 feet east of SR 1300 in the Town of Harrisburg in Cabarrus County. The project is approximately 4.2 miles in length. (See Figure 1.2 for the project study area).

The recommended alignment and proposed improvements consist of widening existing NC 49 to a divided multi-lane highway from the existing four-lane section near UNCC to the Mecklenburg/Cabarrus County line, and then continuing into the Town of Harrisburg with a five-lane section to approximately 1,000 feet east of Morehead Road (SR 1300). Access along the proposed roadway will be permitted.

The project is included in the 1991-1997 North Carolina Transportation Improvement Program, TIP No. 2215, with right of way acquisition scheduled to begin in Fiscal Year 1993 and construction in Fiscal Year 1995. The estimated cost of the project is $10,145,000; with a construction cost of $5,100,000 and right of way cost of $5,045,000.

5. Alternatives Considered

No-Build Alternative

The No-Build Alternative provides for regular maintenance of the existing transportation routes and systems. Examples of regular maintenance include patching and resurfacing roads, regrading shoulders, and maintaining ditches.

Advantages of the No-Build Alternative include:

- No acquisition of residential or business property.
- No impact on wetlands.
- No removal of biotic communities.

Disadvantages of the No-Build Alternative include:

- Deterioration of traffic service to Level "F".
- Increase in number of hours of traffic congestion.
- Potential increase in number of accidents/fatalities.

The No-Build Alternative is not consistent with the local transportation goals or the Thoroughfare Plan. The alternative provides a do-nothing condition for qualitative comparison to the Preferred Alternate, but it is not an effective alternative.

Preferred Alternate

The Preferred Alternate would consist of staged construction from Mallard Creek Church Road (SR 2833) in Mecklenburg County to just west of Caldwell Road (SR 1173) in Cabarrus County, and a five-lane urban section from that point to approximately 1,000 feet east of Morehead Road (SR 1300) in Harrisburg. The typical sections for the staged construction are shown on Figure 3.2. The initial stage would be a four-lane divided rural highway. The second stage would provide a six-lane urban section by adding a lane with curb and gutter in each direction on the outside of the four-lane divided facility. It is anticipated that this stage should be constructed by the year 2004 to maintain an acceptable level of service. The third stage would provide an eight-lane urban section by adding a lane with curb and gutter in each direction in the median of the six-lane divided facility. The construction of this ultimate (third stage) section is dependent upon the completion of Charlotte's Outer Loop and other major thoroughfares, and upon the area's growth. The five-lane section would be an urban curb and gutter facility and is considered to be the ultimate section in Cabarrus County. The typical sections for the five-lane section are shown on Figure 3.3.

6. Environmental Impacts

Implementation of the proposed project will result in positive impacts which include providing adequate roadway capacity for the safe, efficient movement of traffic between UNCC and Harrisburg. The project will also provide system continuity between the existing four-lane section west of Mallard Creek Church Road (SR 2833) and the four-lane section east of Morehead Road (SR 1300). The proposed action is consistent with both local and regional plans for recommended improvements.

The proposed project will require the displacement of five residences and three businesses. The North Carolina Board of Transportation offers a Relocation Assistance Program to help minimize the effects of relocation. Approximately 25 acres of additional right of way will be required to accommodate the proposed project. Construction easements will be required along the project. The project will result in the unavoidable loss of approximately 0.3 acre of wetlands. There will be no major hazardous waste sites impacted by the project, although underground storage tanks may exist at existing or former service stations.

Increased noise levels will be experienced along NC 49 as a result of the proposed project. Two sites were determined to have noise levels that either approach or exceed the noise abatement criteria of 67 dBA. A preliminary evaluation of noise abatement measures indicated that constructing a barrier at one of the sites would possibly be cost-effective. A final determination as to the reasonableness and feasibility of noise abatement measures will be addressed during roadway design and the public involvement process.

There will be other short-term impacts associated with the project. Minimal water quality impacts would likely occur during the construction phase of the project. Erosion control measures will be implemented to minimize potential impacts. There are no floodplains impacted by construction of the project. Motorists will be subjected to minor delays and inconveniences during construction. The project will not impact any 4(f) properties, structures of historical or architectural importance, or archaeological sites. There will be no carbon monoxide exceedances of the National Ambient Air Quality Standards as a result of the project. It is anticipated that no endangered or protected species will be directly affected by the project. However, a scientific survey will be conducted to verify that Schweinitz's sunflower (Helianthus schweinitzii) does not occur in the project area prior to the expenditures of construction funds for this project.

7. List of Environmental Commitments

1. Relocate five residents and three businesses in accordance with applicable state relocation programs.
2. Apply for a general nationwide permit from the U.S. Army Corps of Engineers in conjunction with potential impacts on wetlands.
3. NCDOT will conduct additional scientific surveys in the project corridor to ensure that Schweinitz's sunflower (Helianthus schweinitzii) is not present within the project limits. This investigation will occur prior to the expenditure of construction funds for the proposed improvements.
4. NCDOT will determine the reasonableness and feasibility of noise abatement measures during final roadway design.
5. If noise problems due to construction activities are identified, limit the hours of construction activities to daytime hours or construct noise shields (temporary barriers) as necessary.
6. Measures will be taken to control dust during construction when necessary for the protection and comfort of area motorists and residents.
7. Make special provisions during construction to prevent erosion, sedimentation and construction damage to vegetation outside the right of way boundary and construction limits.
8. Utilize "best management practices" during construction to minimize damages to vegetation and wildlife, including attention to sedimentation and erosion control measures.
9. Have the contractor develop an erosion control schedule prior to the start of work and adhere to the provisions of FHPM 7-7-3.
10. Use temporary erosion control measures (berms, dikes, silt basins, etc.) as needed during construction.
11. Have the contractor adhere to local ordinances governing pollution control.

12. Embankment side slopes will be designed for the maximum grade to avoid fill in the wetlands. Culverts will be sized and located to maintain or enhance the existing surface water conditions of each wetland.
13. Construction activities will be managed to minimize temporary impacts to existing wetlands. All attempts will be made to protect the integrity of existing wetland vegetation where possible. Construction staging areas, equipment or material storage will not be allowed near existing wetlands where accidents or spill could destroy wetland vegetation or pollute wetland water resources.
14. The Division of Highways will hold a pre-construction conference between representatives of the NCDOT, the contractor, representatives of the involved utility companies, and pertinent local officials. Methods to coordinate utility adjustments and to minimize damage or rupture of existing service will be discussed at this conference.
15. Waste or debris shall be disposed of in areas provided by the contractor that are outside of the right of way, unless otherwise required by the plans or special provisions or unless disposal within the right of way is permitted by the responsible engineer.
16. Any burning will be done in accordance with applicable local laws and ordinances, along with regulations of the North Carolina Administrative Code, Title 15. Burning will only be done on the right of way, under constant supervision, with good atmospheric conditions, as remote from existing dwellings as possible.
17. Borrow pits and all ditches will be drained insofar as possible to alleviate breeding areas for mosquitoes. In addition, care will be taken not to block drainage ditches. An extensive rodent control program will be established where structures are to be removed or demolished to prevent the migration of rodents into surrounding areas.
18. Coordination will be initiated with the N.C. Geodetic Survey to ensure that geodetic markers located along the project corridor will be protected.

19. Based on the findings of the environmental screening survey conducted for the project, any underground storage tanks which fall within the limits of construction will be removed in accordance with state requirements and regulations.

8. Coordination

Federal, state, regional, and local agencies were consulted during the preparation of this Environmental Assessment. A scoping letter was distributed to the appropriate agencies to solicit comments and to initiate coordination for the proposed project. The agencies that were contacted are listed as follows:

*NC Department of Administration
*NC Department of Cultural Resources
NC Department of Human Resources
*NC Department of Public Instruction
*NC Department of Environment, Health, and Natural Resources
*Army Corps of Engineers - Wilmington
Environmental Protection Agency, Region IV - Atlanta, GA
*Fish and Wildlife Service, Endangered Species - Asheville
Fish and Wildlife Service, Fish and Wildlife Enhancement - Raleigh
Geological Survey - Raleigh
*Soil Conservation Service - Raleigh
Region D Council of Governments
Mayor of Harrisburg
Cabarrus County Commissioner - Chairman
Mecklenburg County Commissioner - Chairman
*Cabarrus County Manager
*Mecklenburg County Manager

* - indicates input was received by these agencies.

9. Basis for Environmental Assessment

Based on the analysis of potential impacts, it has been determined that no significant adverse impacts upon the quality of the human or natural environment will result from the construction of the proposed project. The project has been reviewed by appropriate Federal, state, and local agencies and no objections have been raised. Public meetings have been held for the project. As a result of these meetings and reviews by appropriate agencies, it is concluded that an Environmental Assessment (EA) is applicable to this project.

NC 49

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Section 1

1.0 PROJECT DESCRIPTION

1.1 General Description

1.1.1 Project Location, Length, and Classification

The project is located in Mecklenburg and Cabarrus Counties of North Carolina, which is in the Piedmont physiographic region. (See Figure 1.1). The segment of NC 49 under study begins at the existing four-lane section at Mallard Creek Church Road (SR 2833) in northeast Mecklenburg County and ends approximately 1,000 feet east of Morehead Road (SR 1300) in the Town of Harrisburg located in Cabarrus County. The project study area is shown on Figure 1.2. The project is approximately 4.2 miles in length. The City of Charlotte is the major urban area in the vicinity of the project. The University Research Park, and the City of Charlotte serve as major employment centers for the surrounding areas in both Mecklenburg and Cabarrus Counties.

NC 49 is a principal arterial in North Carolina's Functional Classification System. It is also designated as a major thoroughfare in the Thoroughfare Plans for Charlotte-Mecklenburg and the Town of Harrisburg. NC 49 is the major east-west route through the Town of Harrisburg and is considered a major interior road in northeast Mecklenburg County.

1.1.2 Purpose of Project

The purpose of the project is to provide for the safe and efficient movement of traffic along NC 49. The existing facility is built to rural standards. Because of the increase in development in the study area, the existing facility cannot meet increasing traffic demands. The existing facility will be upgraded to handle current and future traffic volumes.

1.1.3 Existing Development

The development along the project corridor consist of a mixture of residential, commercial, industrial, and agricultural land uses. The existing development is

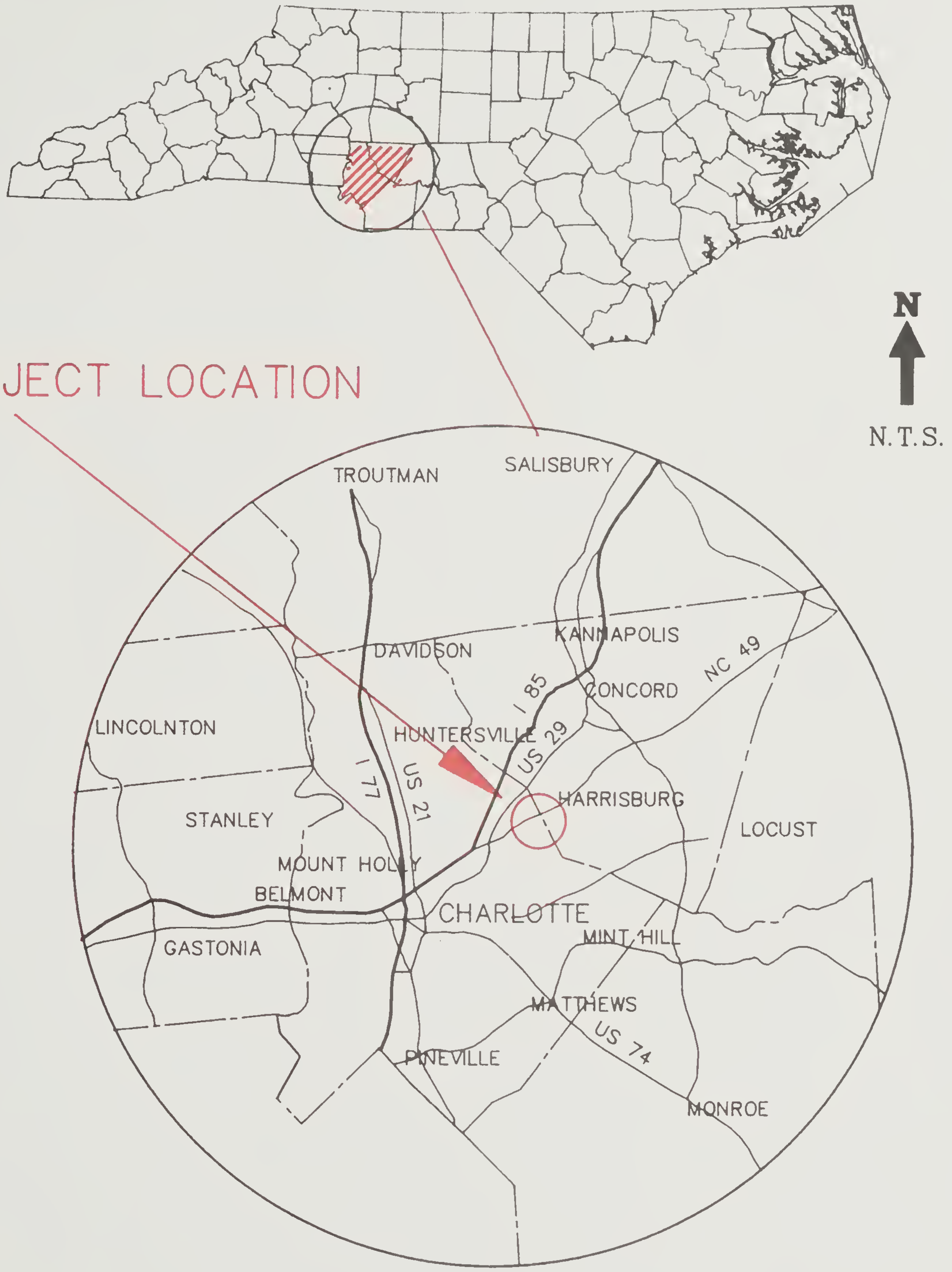

Figure 1.1

PROJECT LOCATION MAP

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

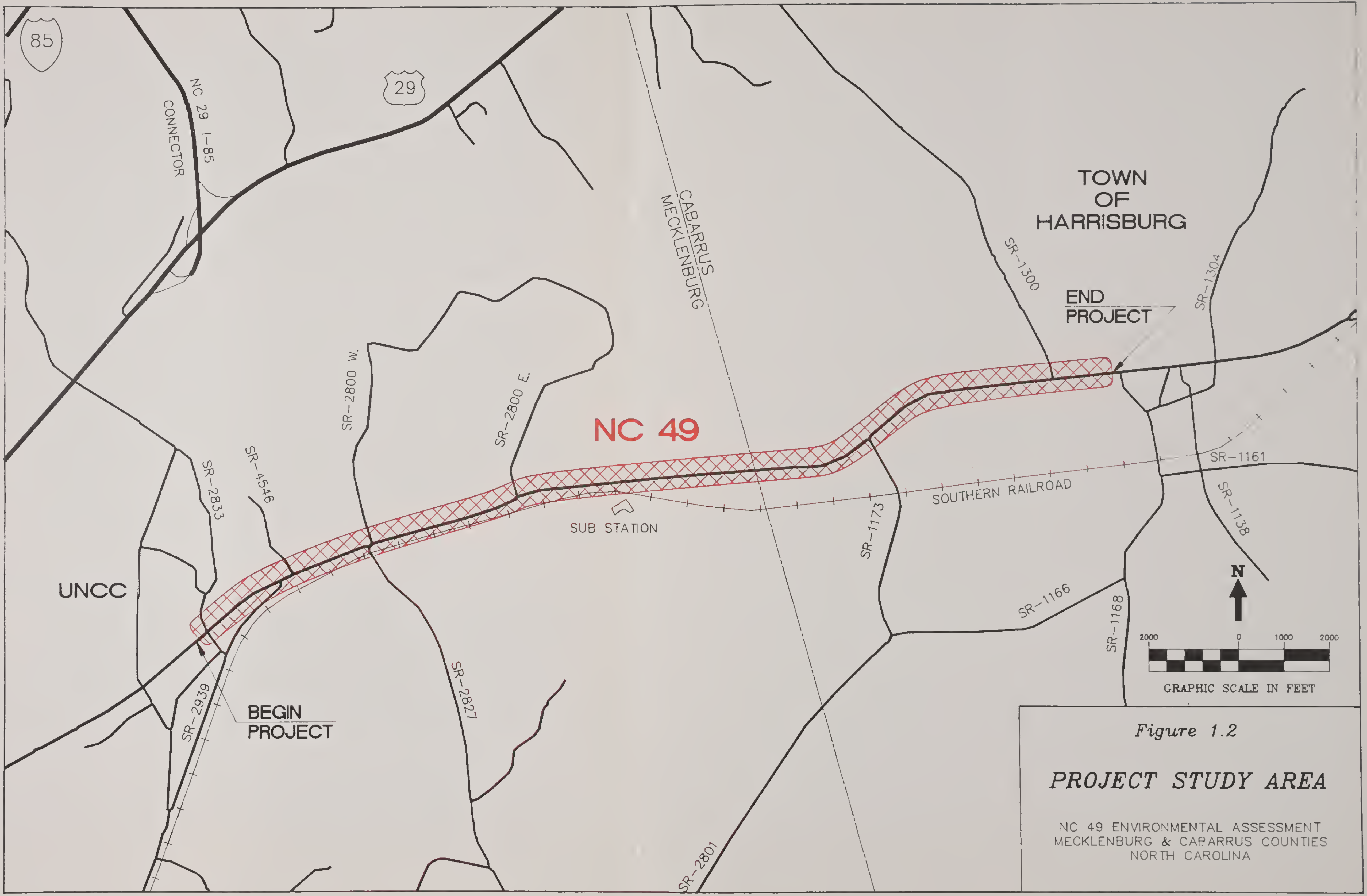

Figure 1.2

PROJECT STUDY AREA

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

mostly scattered with the exception of the Town of Harrisburg. Development between Mallard Creek Church Road (SR 2833) and Harris Houston Road (SR 2800) is a mixture of residential and commercial land uses, with residential being the predominant use. Continuing toward Oak Leigh Drive, most of the land adjacent to the roadway is vacant. Development along the route between Oak Leigh Drive and the Mecklenburg/Cabarrus County line is predominantly residential, with commercial development occurring at or near intersecting roads: There are four major subdivisions located along the route in Mecklenburg County, however the majority of structures are set back from NC 49. These subdivisions include The Villages of Wexford, Shelton, Houston Farms, and Leslie Farms.

Continuing into Cabarrus County, development in the vicinity of the project increases in density. Commercial and industrial land uses are predominant between the county line and Cedar Drive. Continuing toward Morehead Road (SR 1300), development is basically a mixture of residential and industrial land uses, with residential use typically occurring to the north and industrial use to the south. The predominant use is residential. Bentley Hills and Valhalla are two major subdivisions located along the north side of the project. The remaining development along NC 49 from Morehead Road to the end of the project is primarily commercial.

1.1.4 Public Facilities

The public facilities along the proposed project are Back Creek Reformed Presbyterian Church, Carolina Memorial Park, Providence Baptist Church, Harrisburg Presbyterian Church and Cemetery, and the Harrisburg Town Hall. The Charlotte-Mecklenburg School System is planning to construct a middle school and elementary school at the intersection of Harris Houston Road (SR 2800).

1.2 Existing Roadway

1.2.1 Typical Section

The studied segment of NC 49 is approximately 4.2 miles in length. At the western end of the project near UNCC, the existing roadway is a four-lane divided facility consisting of two 32 foot wide pavements (two 12 foot lanes and 4 foot paved shoulders inside and out), 10 foot total useable outside shoulders and a 44 foot median. Just east of Mallard Creek Church Road (SR 2833), the road narrows to a two-lane section that has a 32 foot wide pavement (two 12 foot lanes and 4 foot shoulders) and 10 foot total useable shoulders, and extends into Harrisburg. At Morehead Road (SR 1300) in Harrisburg, the road width widens to approximately 71 feet with curb and gutter along both sides of the roadway.

1.2.2 Right of Way

The existing right of way is as follows:

- At UNCC: Varies from 150 to 250 feet
- From SR 2833 to SR 2827: 150 feet
- From SR 2827 to SR 1300: 100 feet
- From SR 1300 to SR 1166: 60 feet

1.2.3 Horizontal and Vertical Alignment

The existing horizontal and vertical alignments for NC 49 conform to meet current design standards.

1.2.4 Speed Limit

The posted speed limit along NC 49 is 55 mph except at UNCC and around the Leslie Farms Subdivision at east Harris Houston Road (SR 2800) where it is 45 mph. In Harrisburg, the speed limit is 35 mph.

1.2.5 Intersecting Roads and Access Control

All intersecting roads along the studied section of NC 49 connect at-grade. The signalized intersections along the project are:

- Mallard Creek Church Road (SR 2833)
- Caldwell Road (SR 1173)
- Morehead Road (SR 1300)

All of the remaining intersecting roads are controlled by stop signs. There is currently no control of access along the route.

1.2.6 School Bus Use

Both the Charlotte-Mecklenburg School System and the Cabarrus County School System presently use NC 49 as a bus route. There are no public or private schools located along NC 49 within the project limits, although Harrisburg Elementary School is located at the intersection of NC 49 and School Circle Road, approximately one-half mile east of Morehead Road (SR 1300). The Charlotte-Mecklenburg School System is planning to construct a middle school and elementary school at the intersection of west Harris Houston Road (SR 2800). Construction of the elementary school is expected to be completed in 1991. The middle school is expected to be completed by 1995.

1.2.7 Sidewalks/Pedestrian Movements

Currently there are no sidewalks located along NC 49 from the beginning of the project at Mallard Creek Church Road (SR 2833) to the end of the project in Harrisburg. In addition, there are no striped crosswalks to allow for safe pedestrian movements at the three signalized intersections. Pedestrian activity is virtually non-existent in the study area except at these intersections.

1.2.8 Transit

Transit service in Charlotte and Mecklenburg County is provided by the Charlotte Transit System. Currently, there are no routes that provide direct service to NC 49 in the study area. Transit Route 29 does, however, provide service along NC 49 west of Mallard Creek Church Road (SR 2833) and to the campus of UNCC.

1.2.9 Utilities

Figure 1.3 shows existing and proposed utilities located within the project study area. The study area contains one major sub-station and two major overhead power transmission lines. The transmission lines are located approximately 1,800 feet and 3,200 feet, respectively, west of the Mecklenburg/Cabarrus County line. One transmission line tower will be impacted by the proposed project. The location of the power sub-station, which is also in Mecklenburg County, would not be impacted by the proposed project. The sub-station is owned and maintained by Duke Power Company.

Overhead power, cable, and telephone lines run along the north side of NC 49 in Mecklenburg County and along both sides of NC 49 in Cabarrus County and Harrisburg. The presence of natural gas lines was also evident along some portions of the proposed project. A gas pipeline crosses NC 49 approximately 3,500 feet east of Mecklenburg/Cabarrus County line.

Sewer and water services in Mecklenburg County are provided by the Charlotte-Mecklenburg Utility Department. The Town of Harrisburg maintains sewer and water services for the project area in Cabarrus County and Harrisburg. In Mecklenburg County a proposed sewer line (scheduled to be completed in 1992) will cross NC 49 just west of the county line. In Cabarrus County a sewer line parallels the roadway on the north side of NC 49. Existing water mains parallel NC 49 for most of the project length in both counties.

A railroad line parallels NC 49 on the south side and is adjacent to the roadway right of way for approximately one mile. The railroad right of way width is approximately 200 feet.

Conflicts with these utilities will be addressed during the design phase of the proposed project.

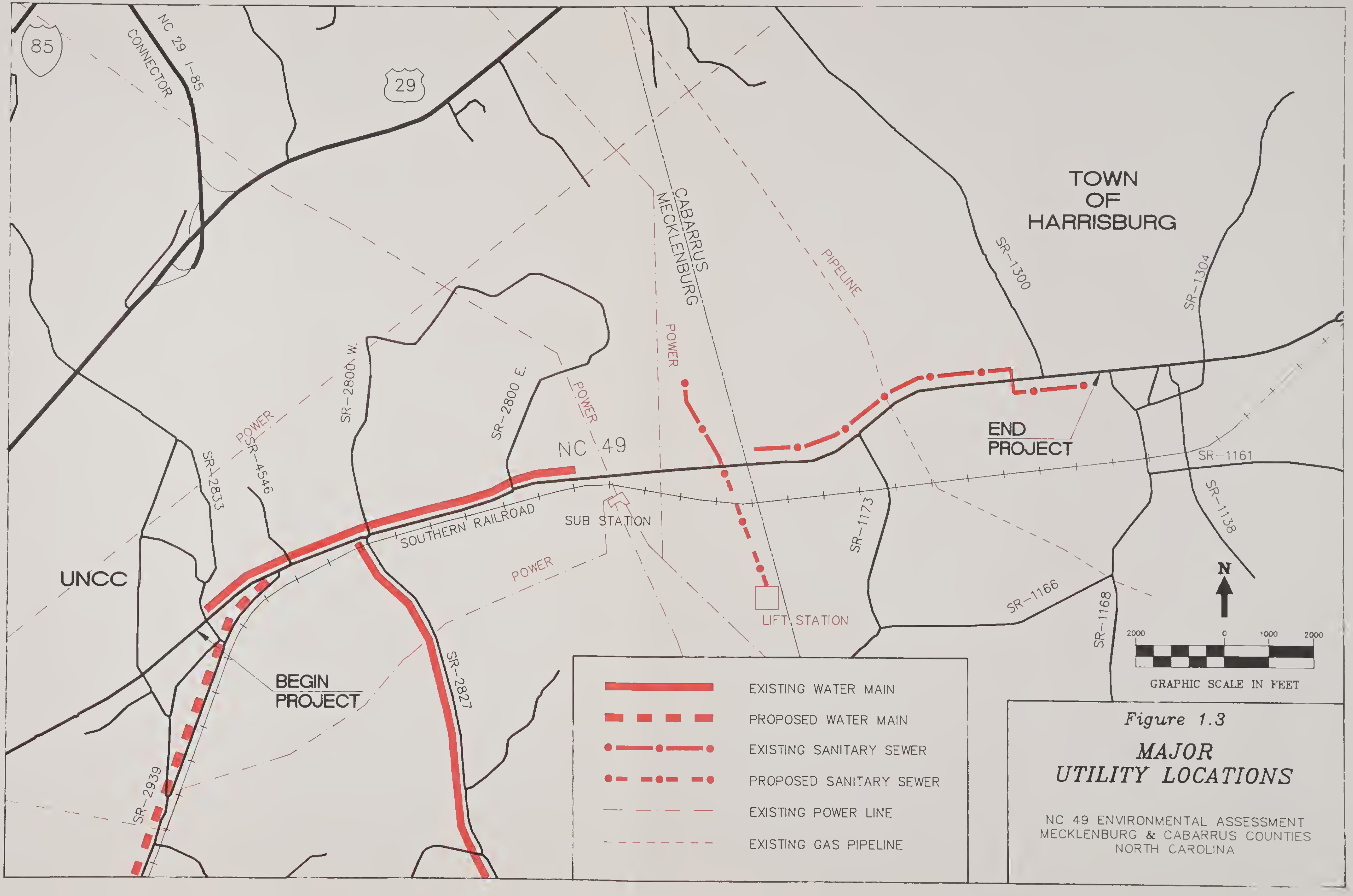

Figure 1.3

MAJOR UTILITY LOCATIONS

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

1.2.10 Monuments

Based on a review of the proposed project, 15 geodetic survey markers would potentially be impacted and would require relocation prior to construction.

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Section 2

2.0 PURPOSE AND NEED FOR ACTION

The purpose of this Environmental Assessment (EA) is to document the various Build and No-Build alternatives evaluated for the proposed improvement of NC 49. This section of the report documents the need for the improvement of NC 49 through the evaluation of current and future transportation demand and the adequacy of the existing and proposed transportation system. Section 3 of this report presents descriptions of the preliminary alternatives considered, and the alternative recommended for action. The potential social, economic, and environmental impacts of the proposed project are discussed in detail in Section 4. The interagency coordination and public involvement processes of the study are presented in Section 5.

2.1 Project Status

A feasibility study for widening NC 49 to a multi-lane facility was completed by the North Carolina Department of Transportation in August 1987. The study recommended widening NC 49 to a four-lane median divided roadway from the existing four-lane section near UNCC to the western town limits of Harrisburg and then to a five-lane section to approximately 1,000 feet east of Morehead Road (SR 1300). The project is included in the 1991-1997 North Carolina Transportation Improvement Program (TIP) with an estimated cost of $8,860,000. Right of way acquisition and construction are scheduled for fiscal years 1993 and 1995, respectively.

2.2 Area Growth

The NC 49 study area, which is basically rural with the exception of the Town of Harrisburg, is presently undergoing transition to an area with suburban characteristics. Based on the 1990 census reports, the study area contains two areas that have the largest percentages of population increase in the region. Population in Mecklenburg County, just east of UNCC increased nearly 86 percent since 1980. The population in western Cabarrus County, in the vicinity of Harrisburg, also increased significantly since 1980 by approximately 52 percent. Because of the proximity of the study area to major highways and employment centers in Charlotte, the increase in population is expected to continue to follow the trend of the last decade. The 1980 estimated population for Mecklenburg County was 404,270, and for Cabarrus County the figure was 85,895. The 1990 census figures for Mecklenburg and Cabarrus are 511,433 and 98,935, respectively.

2.3 Economic Factors

Employment statistics for the two counties as of January 1991 were as follows:

Mecklenburg		
Labor Force		283,220
Total Persons Employed		271,610
Total Persons Unemployed	(4.1%)	11,610
Cabarrus		
Labor Force		56,420
Total Persons Employed		53,710
Total Persons Unemployed	(4.8%)	2,710

2.4 System Linkage

The proposed widening of NC 49 is an essential element designed to improve access between the City of Charlotte and the Town of Harrisburg. On a much larger scale, NC 49 is also considered as a critical link or connector between two strategic corridors within the state's highway network. NC 49 currently serves as a link between I-85 in Charlotte and US 64 in Asheboro. The proposed widening of NC 49 from Harrisburg to the Yadkin River and from there to the proposed Asheboro Outer Loop is included in the state's current TIP 1991-1997, although all projects are subject to the availability of funds.

In terms of a smaller network, NC 49 is the only major east-west thoroughfare in the area. As discussed earlier, NC 49 is designated as a major thoroughfare in the Thoroughfare Plans for both Charlotte-Mecklenburg and the Town of Harrisburg. The majority of existing roads in the project area are built to rural standards (narrow two-lane roads). In addition to NC 49, the Thoroughfare Plans identify other facilities that would improve system linkage in the study area. These facilities are shown in Figure 2.1 and are described as follows:

Charlotte Outer Loop - The Outer Loop will serve as a circumferential freeway around the City of Charlotte. The East Outer Loop project, TIP No. 2123CA, which includes an interchange with NC 49 just east of Back Creek Church Road (SR 2827) is currently scheduled for right of way acquisition to begin in FY 92 and construction in FY 97.

Eastern Circumferential - The proposed Eastern Circumferential will be classified as a major thoroughfare. This project will facilitate circumferential travel between the northeast and southeast portions of Mecklenburg County. The current proposed alignment intersects NC 49 just east of Mallard Creek Church Road (SR 2833) at or near Marlyn Drive. This project is currently scheduled in the City of Charlotte's Ten Year Capital Needs Assessment FY 1991 - 2000 for right of way acquisition and construction to begin between FY 1996 and FY 2000.

Mallard Creek Church Road Widening - The road is classified as a major thoroughfare and intersects NC 49 near UNCC. The project would involve widening Mallard Creek Church Road (SR 2833) to a four-lane facility between I-85 and NC 49. The project identified as TIP No. U-2508, is scheduled for right of way acquisition to begin in FY 94 and construction in FY 95.

Light Rail - Included in the transportation plan for Charlotte/Mecklenburg is a potential light rail corridor that follows an existing rail line adjacent to Old Concord Road. The corridor crosses NC 49 at the intersections of Mallard Creek Church Road (SR 2833) and Old Concord Road. There is no timetable currently planned for this improvement.

Alexander Avenue - The extension of Alexander Avenue from NC 49 to Robinson Church Road will help alleviate congestion on Robinson Church Road as it approaches NC 49. Currently motorists desiring to travel north and south must get on NC 49 or cut

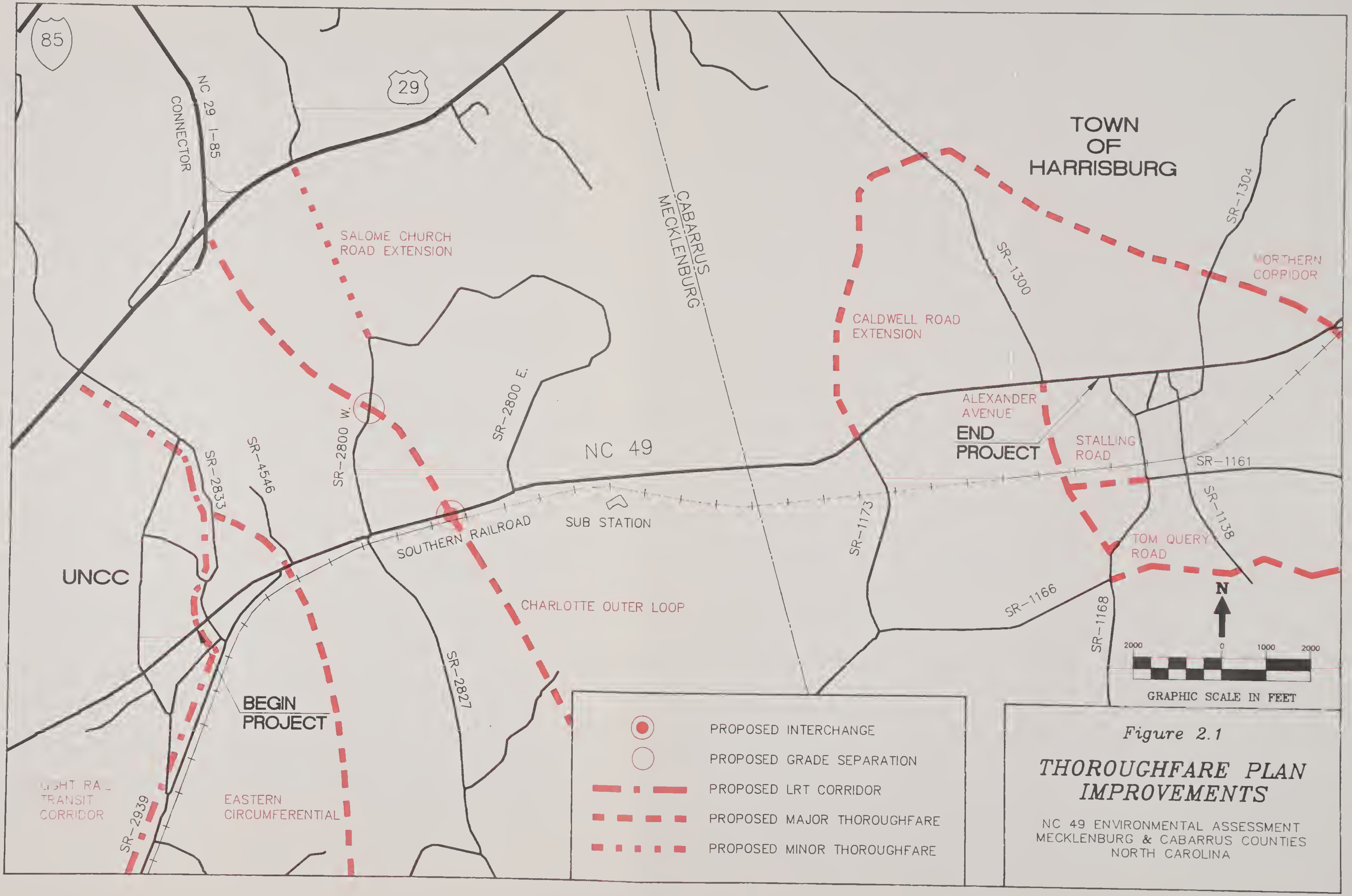


Figure 2.1

THOROUGHFARE PLAN IMPROVEMENTS

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

through neighborhood streets. This extension will allow for a continuous north-south movement through Harrisburg. There is no timetable currently planned for this improvement.

Caldwell Road Extension - The Caldwell Road Extension is classified as a major thoroughfare. It will serve as the major north-south roadway in the western part of Harrisburg and will help alleviate traffic congestion on Morehead Road (SR 1300). Beginning at the intersection of NC 49, the proposed alignment would continue north and then northeast to intersect with Morehead Road. There is no timetable currently planned for this improvement.

Northern Corridor - This new facility will begin at NC 49 in eastern Harrisburg and continue northwesterly to connect with Morehead Road (SR 1300) at the intersection with the proposed Caldwell Road Extension. This facility will permit east-west travel in northern Harrisburg without use of NC 49, or existing neighborhood streets. When connected with Tom Query Road, it will also create an inner loop that will be greatly needed as residential development continues in southern Harrisburg. There is no timetable currently planned for this improvement.

Stalling Road - Extending Stalling Road to Alexander Avenue will allow for access to Alexander Avenue from the east. Commuters will be able to access NC 49 via Stalling Road and Alexander Avenue instead of using Robinson Church Road or Hickory Ridge Road and School Circle. The latter facilities were not designed to accommodate heavy traffic volumes. There is no timetable currently planned for this improvement.

Tom Query Road - The extension of Tom Query Road eastward to connect with the Northern Corridor will create an east-west facility to serve residential areas south of NC 49. This would provide an alternate route to NC 49 for Mecklenburg County commuters. It would also offer residents south of NC 49 a route to NC 49 east of Harrisburg without going through the downtown area. There is no timetable currently planned for this improvement.

Harrisburg Bypass - The Harrisburg Bypass was not addressed in the Harrisburg Thoroughfare Plan, adopted on November 9, 1990. All alternatives to locate this facility within the jurisdiction of the Town of Harrisburg have been exhausted without the recommendation of a feasible alignment. A relocation of NC 49 to the south of Harrisburg is currently under study by Cabarrus County officials and NCDOT. A further discussion of this facility will be addressed in a future updated Thoroughfare Plan.

2.5 Transportation Demand

2.5.1 Mecklenburg County

The *2005 Transportation Plan* represents the first major transportation planning effort since 1983. The preparation of the *2005 Transportation Plan* was the result of a key recommendation of the *Generalized Land Plan 2005*, which was adopted in 1985 by the Charlotte City Council and the Mecklenburg Board of County Commissioners. The major goals of the *2005 Transportation Plan* were to ensure consistency with the proposals, goals, and objectives of the *Generalized Land Plan 2005*, and to identify the transportation improvements needed to support projected population and employment growth. The Charlotte Department of Transportation was the primary agency responsible for preparing this long-range plan.

One of the specific products of the *2005 Transportation Plan* was the development of the 1988 Charlotte-Mecklenburg Thoroughfare Plan. The 1988 Charlotte-Mecklenburg Thoroughfare Plan is an update of the 1983 Thoroughfare Plan and encompasses all of Mecklenburg County. The revised Thoroughfare Plan reflects the goals and objectives of the *Generalized Land Plan 2005* and was adopted by the Metropolitan Planning Organization (MPO) in November 1988.

Based on an analysis of 2005 traffic conditions, the Charlotte Department of Transportation identified a list of 76 unfunded roadway projects required to meet future traffic needs. These projects were identified in addition to the 19 roadway projects and one interchange project selected for funding by Federal, state and local sources. Those projects previously identified for funding are identified in Table 2.1.

Subsequent analysis of future conditions indicated that 39 of the 76 projects were needed by 1997. The remaining projects were identified for construction between 1997 and 2005. The 39 projects identified as necessary by 1997 were evaluated and ranked by local transportation staff. The projects were prioritized based on 10 equally weighted criteria. The final list was then used to recommend projects to be included in the Charlotte-Mecklenburg Transportation Improvement Program (TIP) and the City of Charlotte's Capital Improvement Program (CIP).

In the preparation of the Fiscal Year 1990-1994 Charlotte-Mecklenburg TIP, the Charlotte-Mecklenburg MPO reevaluated the 1997 roadway project rankings using the reduction of existing congestion as an additional criterion. Based on this re-evaluation, Table 2.2 shows the priority rankings of projects recommended to be included in the TIP, as well as their original ranking. The widening of NC 49 from UNCC to Harrisburg is currently ranked eighth on the list of TIP projects. The Charlotte-Mecklenburg TIP identifies projects to be funded by the City of Charlotte and is used by NCDOT to set priorities in the state's TIP.

2.5.2 Cabarrus County

Future transportation and land use needs in the project area for Cabarrus County are addressed in the Town of Harrisburg's recommended Thoroughfare Plan. The Thoroughfare Plan was revised and adopted by the North Carolina Department of Transportation on November 9, 1990. Those projects identified in the Thoroughfare Plan for Harrisburg are included on Figure 2.1. The plan differentiates between major and minor thoroughfares and identifies them as either proposed new roadways and/or extensions of existing facilities.

TABLE 2.1

FUNDED TRANSPORTATION PROJECTS IN CHARLOTTE-MECKLENBURG

PROJECT DESCRIPTION	From	To	Improvement	COST (millions)	RESPONSIBLE AGENCY
Westinghouse Blvd. Extension	US 521	Old Nations Ford Rd.	New construction	6.1	City of Charlotte
I-77/Arrowood Rd.	--	--	Interchange	15.8	State
Matthews Bypass (NC 51)	--	--	New construction	24.3	State
W.T. Harris Blvd.	Mallard Creek Rd.	I-77	Widen to 4 lanes	12.0	State
Newell-Hickory Grove Rd.	The Plaza	Albemarle Rd.	Widen to 4/6 lanes	11.7	State
Park Rd.	Goneaway Rd.	Sharon Rd.	Widen to 4 lanes	3.0	City of Charlotte
Monroe Rd.	Eaglewood Ave.	Village Lake Dr.	Widen to 4 lanes	2.2	State (City-funded)
Albemarle Rd. (NC 24-27)	Lawyers Rd.	NC 51	Widen to 4 lanes	22.5	State
Colony Rd. Extension	Sharon View Rd.	Carmel Rd.	New construction	2.8	City of Charlotte
Mallard Creek Church Rd.	Mallard Creek Rd.	I-85	Widen to 4 lanes	3.8	State
Beatties Ford Rd.	I-85	Capps Hill Mine Rd.	Widen to 4 lanes	7.4	State (City-funded)
Idlewild Rd.	Electra Ln.	Idlewild Rd. North	Widen to 4 lanes	2.9	City of Charlotte
US 74	Brookshire Fwy.	Albemarle Rd.	HOV lane	17.6	State
NC 160 Relocation	Airport Dr.	Wilmont Dr.	New construction	5.2	State (City-funded)
Shamrock Dr.	Eastway Dr.	Sharon Amity Rd.	Widen to 4 lanes	11.1	City of Charlotte
Park Rd./Johnston Rd.	Sharon Rd.	NC 51	Widen to 4/6 lanes	33.0	City of Charlotte
Sardis Rd.	Rama Rd.	Sardis Rd. North	Widen to 4 lanes	13.0	City of Charlotte
Carmel Rd.	Quail Hollow Rd.	NC 51	Widen to 4 lanes	15.0	City of Charlotte
Milton Rd.	The Plaza	Sharon Amity Rd.	Widen to 4 lanes	6.0	City of Charlotte
Albemarle Rd. (NC 24-27)	NC 51	US 601	Widen to 4 lanes	18.2	State

TABLE 2.2

PRIORITY PROJECT RANKINGS

TIP* RANKING	2005 PLAN RANKING	PROJECT	COST (millions of 1989 Dollars)
1	3	I-77 Widening (I-85 to South Carolina)	98.0
2	1	US 74/Sharon Amity Interchange	12.0
3	2	US 74 Expwy. (Albemarle Rd. to Idlewild Rd.)	24.0
4	4	Freedom Dr. Widening (I-85 to Mt. Holly Rd.)	28.0
5	5	York Rd. Widening (Tyvola Rd. to South Carolina)	22.0
6	9	Fairview Rd. Widening (Park Rd. to Colony Rd.)	6.2
7	10	Sharon Rd. Widening (Sharon View Rd. to Sharon Ln.)	4.0
8	15	NC 49 North Widening (UNCC to Harrisburg)	8.6
9	17	Providence Rd. Widening (International Dr. to High Ridge Rd.)	13.0
10	6	Graham St. Ext. (Sugar Crk. Rd. to Mallard Crk. Rd.)	10.0
11	8	I-77/Sam Furr Rd. Interchanges	3.0
12	11	Westinghouse Blvd. Widening and Extension (NC 49 to Sugar Creek Rd.)	15.1
13	7	NC 49/Graham Street Connector	14.2
14	14	Fairview Rd. Widening (Providence Rd. to Carmel Rd.)	2.5
15	12	Statesville Rd. Widening (Newland Rd. to Hickory Ln.)	6.0
16	18	Eastway Dr. Widening (Sugar Creek Rd. to Kilborne Dr.)	4.4
17	13	Woodlawn Rd. Widening (I-77 to South Blvd.)	3.0
18	19	US 521 Relocation (Southern Outer Belt to South Carolina)	8.4
19	16	Statesville Rd. Widening (Starita Rd. to Keith Dr.)	20.0
20	20	Northwest Circumferential (Little Rock Rd. to Reames Rd.)	40.0
21	21	Vance Rd. Ext. (Lakeview Rd. to Northern Outer Belt)	16.0
22	22	Mallard Crk. Church Rd. Widening (NC 49 to I-85)	13.0
23	23	Billy Graham Pkwy./West Blvd. Interchange	7.5
24	25	Colony Rd. Extension (Carmel Rd. to Rea Rd.)	6.2
25	24	Beatties Ford Rd. Widening (Capps Hill Mine Rd. to Lakeview Rd.)	7.4
26	26	US 74 Collectors (McAlpine Creek to NC 51)	35.0
27	28	Johnston Rd. Ext. (Porterfield Rd. to Southern Outer Belt)	5.4
28	27	Lawyers Rd. Widening (Albemarle Rd. to Wilson Grove Rd.)	20.0
29	29	Brookshire Blvd. Widening (I-85 to Hoskins Rd.)	2.0
30	30	NC 115 Widening (Statesville Rd. to W.T. Harris Blvd.)	7.5
31	31	Mallard Crk. Rd. Widening (Graham St. Extension to W.T. Harris Blvd.)	8.6
32	32	Arrowood Rd. Extension (York Rd. to Brown Grier Rd.)	9.0
33	33	North Graham St. Widening (Brookshire Freeway to Statesville Ave.)	2.5
34	34	Eastern Circumferential (Mallard Creek Church Rd. to Independence Blvd.)	96.0
35	35	Hoskins Rd. Widening (Brookshire Fwy. to Rozzelles Ferry Rd.)	1.0
36	36	South Blvd. Widening (Woodlawn Rd. to Tyvola Rd.)	15.0
37	37	Cindy Ln. Extension	3.0
38	38	Seventh St. Widening (Independence Blvd. to Laurel Ave.)	3.0

☐ Indicates current study area projects.

* - FY 1990-94 Charlotte-Mecklenburg TIP.

2.6 Capacity

2.6.1 Existing Traffic

Existing 1990 traffic data along NC 49 is presented in terms of average daily traffic (ADT) and includes other roadway traffic characteristics such as design hourly volume (DHV) percentages, truck traffic percentages, and directional distribution percentages. Traffic information was also provided for major cross streets in the corridor.

Review of 1990 traffic data shows that traffic volumes along NC 49 ranged from approximately 17,000 to 22,400 vehicles per day. The segment with the highest projected traffic is located just east of Old Concord Road (SR 2939). The segment with the lowest volume occurs near the Mecklenburg/Cabarrus County line just east of SR 2800 East. In Harrisburg, traffic volumes ranged from 18,400 to 20,100 vehicles per day.

There are only two cross streets that carry a significant amount of traffic to NC 49. Mallard Creek Church Road (SR 2833), located at the west end of the project, is estimated to carry between 4,300 and 12,300 vehicles per day. At the east end of the project, Morehead Road (SR 1300), is projected to carry 6,300 vehicles per day.

2.6.2 Existing Level of Service

There are two principal concepts in estimating the maximum amount of traffic that can be efficiently accommodated by a roadway: capacity and level of service. To attempt to simply define the availability of physical space provided by a facility or it's capacity would not completely describe the facility's operational state for any given period. Generally, roadways operate very ineffectively at or near capacity.

A more meaningful method to determine how a roadway is functioning is to measure level of service (LOS). Level of service is defined as a qualitative measure of operational conditions and the perception of these conditions by motorists and/or passengers. Operational conditions are usually defined in terms of factors such as average travel speed, delay, and capacity utilization.

There are six levels of service, which are designated by the letters "A" through "F." Level of service "A" represents the best operating conditions and level of service "F," represents the worst. Level of service criteria for a two-lane rural facility such as NC 49 are defined as follows:

- *Level of service A* represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

- *Level of service B* is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS "A." The level of comfort and convenience provided is somewhat less than at LOS "A," because the presence of others in the traffic stream begins to affect individual behavior.

- *Level of service C* is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

- *Level of service D* represents high-density, but stable, flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

- *Level of service E* represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely limited, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

- *Level of service F* is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level of service "F" is used to describe the operating conditions within the queue, as well as the point of the breakdown.

The methodology used to analyze the capacity and level of service of NC 49 was based on standard traffic engineering procedures outlined in the *Highway Capacity Manual (HCM) Special Report 209*, Chapter 8, "Two-Lane Highways." The analysis was performed using the highway capacity software (HCS), a microcomputerized version of the HCM developed by the Federal Highway Administration (FHWA). The procedure uses traffic and geometric conditions of the facility such as traffic volumes, percent of heavy vehicles, design speed, lane and shoulder widths, grades, and directional distributions. The results of the capacity analysis performed for existing conditions are shown in Table 2.3.

2.6.3 Signalized Intersections

In addition to analyzing free-flowing segments of a facility, it is often important to analyze points of fixed interruptions such as traffic signals. Since traffic flow is usually controlled by these interruptions, analyzing the capacity at the intersection may provide a better indication of how the facility operates. For this reason, capacity analysis was performed for the three signalized intersections in the project corridor. These intersections are:

- Mallard Creek Road (SR 2833)
- Caldwell Road (SR 1173)
- Morehead Road (SR 1300)

The analysis was performed using the procedures outlined in the *Highway Capacity Manual*, Chapter 9, "Signalized Intersections," and HCS. In the analysis of signalized intersections, another factor is introduced into the evaluation of capacity and level of service: time allocation. A traffic signal allocates time for conflicting traffic movements to use the same physical space. Based on the amount of traffic wishing to use this time, level of service is then evaluated in terms of average stopped-delay.

Information on traffic signal timing was provided by the Traffic Service Division of the North Carolina Department of Transportation. The results of the capacity analysis performed for the three signalized intersections indicate that traffic flow at these intersections is currently operating at LOS D during peak-hour conditions.

TABLE 2.3

1990 TRAFFIC VOLUMES AND LEVEL OF SERVICE ANALYSIS

NC49

From	To	Existing Facility	1990 ADT	1990 Peak Hour Volume	Level of Service
Mallard Creek Church Rd.	Old Concord Rd.	2-lane rural	19,400	2,153	E
Old Concord Rd.	SR 4546	2-lane rural	22,400	2,486	F
SR 4546	Back Creek Church Rd.	2-lane rural	22,200	2,464	F
Back Creek Church Rd.	Harris Houston Rd. W.	2-lane rural	21,800	2,420	F
Harris Houston Rd. W.	SR 4617	2-lane rural	20,700	2,298	E
SR 4617	Harris Houston Rd. E.	2-lane rural	19,500	2,165	E
Harris Houston Rd. E.	Millbrook Rd.	2-lane rural	17,500	1,943	E
Millbrook Rd.	Caldwell Rd.	2-lane rural	17,600	1,954	E
Caldwell Rd.	Cedar Dr.	2-lane rural	18,000	1,998	E
Cedar Dr.	Ford St.	2-lane rural	18,400	2,042	E
Ford St.	SR 1300	2-lane rural	19,200	2,131	E

Under these conditions, longer periods of delay are noticeable and high volume to capacity (V/C) ratios result. A high V/C ratio generally indicates that a deficiency exists and identifies the need for improvements.

2.6.4 Future Traffic

Traffic volumes were projected for the construction year (1995) and the design year (2015) along NC 49 and are shown in Figure 2.2. These traffic volumes are based on significant increases in population and development projected for the northeast Mecklenburg area. By 2015, traffic is projected to increase approximately 200 percent over 1990 traffic. Based on these volumes, capacity analysis was performed to determine if the existing facility would accommodate future traffic levels. If no improvements are made to NC 49 traffic flow would certainly deteriorate to level of service "F." Traffic flow at signalized intersections would also operate at level of service "F," resulting in long, unacceptable travel delays for motorists.

2.7 Accident Statistics

In addition to an analysis of roadway capacity and level of service, the number and types of accidents experienced were evaluated to determine the adequacy of the existing facility and the need for improvements. An accident study was conducted from January 13, 1986, through March 31, 1990, by the Traffic Engineering Branch of the NCDOT. This study indicated that a total of 184 accidents, including 83 non-fatal injury accidents, were recorded during this period in the project corridor. No fatal accidents were recorded. The highest accident frequency occurs in the vicinity of the intersection of Harris Houston Road (SR 2800) with 20 accidents. The intersection of Morehead Road (SR 1300) was recorded to have 13 accidents. Accident statistics were summarized by county, and the number of total accidents, fatal accidents, and non-fatal injury accidents were tabulated for each county. Results of the accident study are presented in Table 2.4.

Accident rates were determined by dividing the number of accidents by the annualized vehicle miles of travel. A comparison of the accident rates for each county indicated that

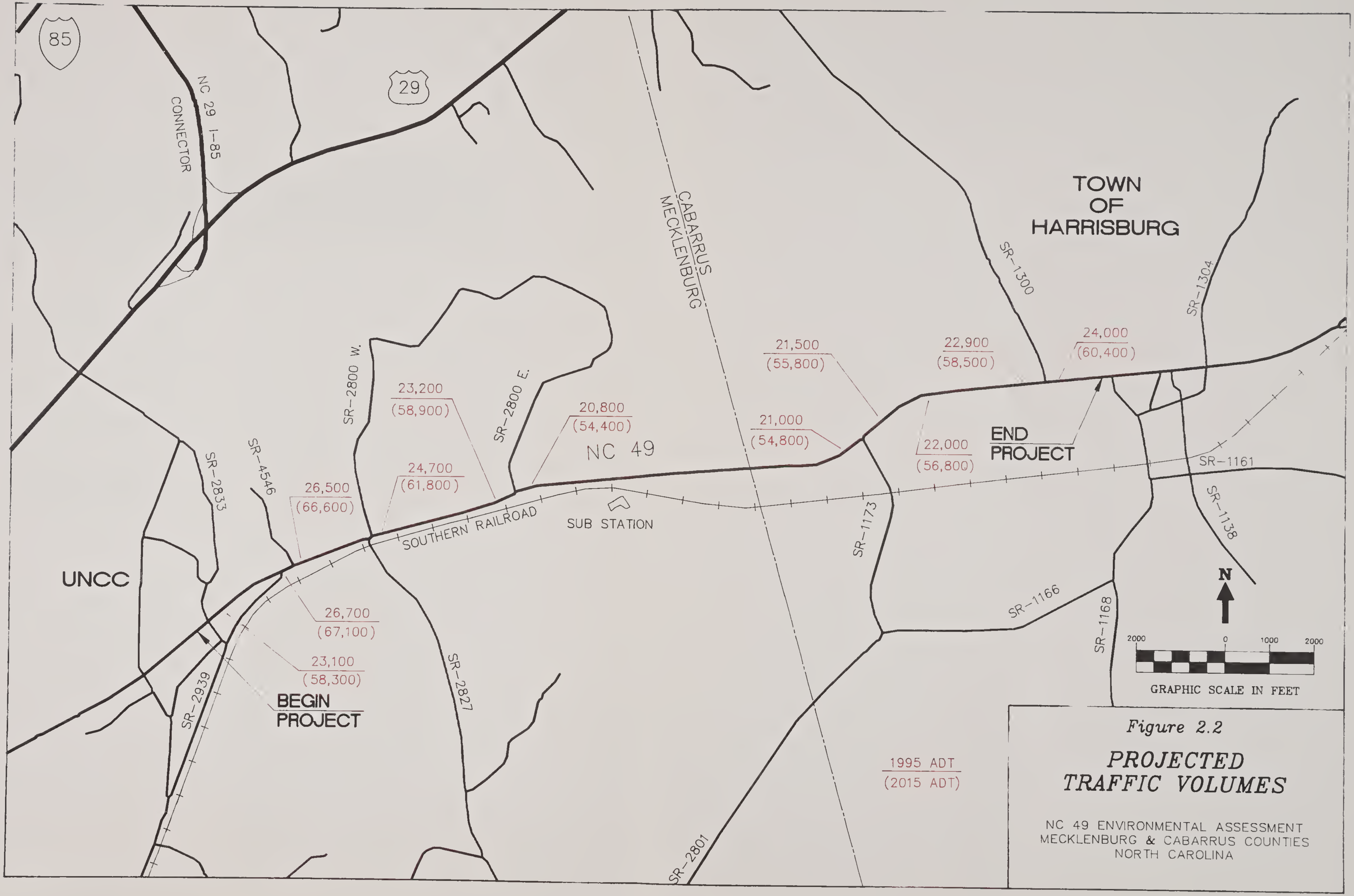


Figure 2.2

PROJECTED TRAFFIC VOLUMES

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

TABLE 2.4

ACCIDENT DATA SUMMARY

NC 49	Mecklenburg County	Cabarrus County	Statewide Avg. for Rural NC Routes 1990
TOTAL ACCIDENTS	101	83	--
FATAL ACCIDENTS	0	0	--
NON-FATAL INJURY ACCIDENTS	47	36	--
TOTAL ACCIDENT RATE	208.76	219.98	199.3
FATAL ACCIDENT RATE	0.0	0.0	2.9
NON-FATAL INJURY ACCIDENT RATE	97.15	95.41	97.6

the segment of NC 49 in Cabarrus County has the highest total accident rate. However, both of the total accident rates for Mecklenburg County and Cabarrus County exceed the 1990 statewide average for similar type highways. A more detailed review of accident data for NC 49 reveals that "rear-end" accidents constitute the highest percentage of accidents. The majority of these accidents can be attributed to vehicles making left turns at locations where storage lanes are not provided and by motorists who cannot avoid vehicles in queue behind left-turning traffic. The improvement of NC 49 to a multi-lane facility would eliminate a majority of these types of accidents. The addition of through lanes would reduce congestion and travel delay, resulting in an overall improved level of service.

2.8 Summary of Project Need

NC 49 serves as a major east-west thoroughfare for Mecklenburg and Cabarrus Counties. More directly, it serves to provide access between the City of Charlotte and the Town of Harrisburg. Population and economic statistics have indicated that the project area has experienced significant growth in recent years and will continue this trend. With existing traffic currently operating at congested, undesirable levels and accident rates exceeding the statewide average for rural two-lane highways, the need for improving NC 49 to a multi-lane facility is crucial. The improvements would reduce traffic congestion and the potential for accidents along NC 49, thereby resulting in a safer, more-efficient facility.

NC 49

FROM THE EXISTING FOUR LANE SECTION NEAR UNCC
TO APPROXIMATELY 1000 FEET EAST OF SR 1300 IN HARRISBURG
MECKLENBURG AND CABARRUS COUNTIES
FEDERAL-AID PROJECT NO. F-28-1(4)
STATE PROJECT NO. 8.1672601
T.I.P. NO. R-2215

Section 3

3.0 ALTERNATIVES CONSIDERED

This section of the Environmental Assessment provides a general summary of all alternatives considered. The discussion includes the No-Build Alternative, Preliminary Build Alternatives, and the Preferred Alternate.

3.1 No-Build Alternative

The No-Build Alternative provides for regular maintenance of the existing transportation routes and systems. Examples of regular maintenance include patching and resurfacing roads, regrading shoulders, and maintaining ditches.

Advantages of the No-Build Alternative include:

- No acquisition of residential or business property.
- No impact on wetlands.
- No removal of biotic communities.

Disadvantages of the No-Build Alternative include:

- Deterioration of traffic service to Level "F."
- Increase in number of hours of traffic congestion.
- Potential increase in number of accidents/fatalities.

The No-Build Alternative is not consistent with the local transportation goals or the Thoroughfare Plan. The alternative provides a do-nothing condition for qualitative comparison to the Build Alternatives, but it is not an effective alternative.

3.2 Preliminary Build Alternatives

The scope of the project is multi-laning the existing two lane roadway to improve capacity and safety while minimizing the impacts to the community and environment. New location alternatives were not considered within the scope of this project.

As a principal arterial and a major thoroughfare, NC 49 would be widened to a multi-lane facility. Two variations of the Build Alternative were considered. The first was to five-lane the entire project. The second was to provide a multi-lane divided facility in Mecklenburg County with transition to a five-lane facility in Cabarrus County.

The five-lane facility for the entire project would not provide acceptable levels of service for the design year (2015). This type of facility is generally designed for lower speeds and where development occurs on both sides of the highway. In Mecklenburg County, development along NC 49 is intermittent with the Norfolk Southern Railroad adjacent to and parallelling NC 49 to the south for approximately 1.5 miles. As a result, a five-lane facility in Mecklenburg County is not practical.

A multi-lane divided facility in Mecklenburg County with the initial stage being a four-lane divided facility with a 46 foot grass median and the ultimate facility being an eight-lane divided facility with a raised 22 foot grass median was evaluated. Since the Norfolk Southern Railroad parallels NC 49 to the south, widening to the north is the most practical from a design standpoint. However, approximately 3,000 feet west of the Mecklenburg/Cabarrus County line, widening would shift from the north side to the south side to avoid impacts to Carolina Cemetery Park on the north side of NC 49 at the county line. Also, widening to the south in this area would have less right of way impacts and less wetland impacts.

In Cabarrus County the multi-lane divided facility would transition to a five-lane facility. The west town limits of Harrisburg begin at the Mecklenburg/Cabarrus County line. From this point to the end of the project, commercial and industrial development has occurred and is continuing to occur. Widening beyond a five-lane section would have a major disruption to the Town of Harrisburg's commercial area. Since the level of service would deteriorate to an "F" by the design year (2015), a relocation of NC 49 around Harrisburg is under study to alleviate this traffic congestion.

Based on the conclusions previously stated, the Preferred Alternate is recommended as a multi-lane divided facility in Mecklenburg County with widening to the north and transitioning to a five-lane facility in Cabarrus County.

3.3 Preferred Alternate

3.3.1 Type of Improvement

The proposed improvement will provide sufficient capacity to meet increased travel demand in Mecklenburg County, provide a higher grade facility, and increase the average running speed as well as safety. The improvements consist of staged construction from Mallard Creek Church Road (SR 2833) in Mecklenburg County to just west of Caldwell Road (SR 1173) in Cabarrus County and a five-lane urban section from that point to approximately 1,000 feet east of Morehead Road (SR 1300) in Harrisburg. Stage I of the three-stage process will provide a four-lane divided rural highway. Stage II will provide a six-lane urban section by adding a lane with curb and gutter in each direction on the outside of the four-lane divided facility. Stage III will add a lane, with curb and gutter, in each direction in the median of the six-lane divided facility.

The horizontal alignment will basically follow the existing alignment of NC 49 except at the beginning of the project from Mallard Creek Church Road (SR 2833) to just east of Old Concord Road (SR 2939). In order to avoid impacts to the University Terrace Condominium Apartments, the roadway will be rebuilt with a "flatter" horizontal curve. From just east of Old Concord Road to approximately 3,000 feet west of the Mecklenburg/Cabarrus County line, the roadway will be widened to the north to avoid impacts to the Norfolk Southern Railroad, which parallels and is adjacent to the proposed project in this area. From approximately 3,000 feet west of the Mecklenburg/Cabarrus County line to approximately 1,300 feet west of the Mecklenburg/Cabarrus County line, the widening would move from the north side to the south side to avoid a cemetery and additional impacts to wetlands and businesses. From that point to approximately 400 feet west of Caldwell Road (SR 1173), the widening would be to the south and then transition to a symmetrical five-lane section. From that point to approximately 1,600 feet west of Morehead Road (SR 1300), widening to a five-lane section would be symmetrical. The widening would transition from symmetrical widening to widening on the south side west of Morehead Road (SR 1300) to avoid the Harrisburg Presbyterian Church Cemetery and would taper to the existing pavement at SR 1168. In the transition from widening to the north to widening to the south just west of the Mecklenburg/Cabarrus County line, the existing roadway will be removed. Sections of the existing roadway not removed will be resurfaced with a bituminous overlay. Other improvements will consist of intersection revisions. The proposed alignment, improvements and right of way are shown in Figure 3.1. Additional right of way is needed throughout the project except for the five-lane symmetrical widening section in Harrisburg.

3.3.2 Typical Sections and Design Speed

The proposed typical sections for the project are shown in Figures 3.2 and 3.3. Stage I construction would consist of constructing two additional lanes. The typical section consists of two 12 foot lanes in each direction with four foot paved shoulders on the inside and outside, divided by a 46 foot median. The existing 32 foot roadway (two 12 foot lanes with four foot shoulders) will be resurfaced. Useable outside shoulders of 10 feet will be provided.

Stage II construction will consist of widening the section constructed under Stage I by 12 feet on the outside in each direction and adding curb and gutter to the outside. This will provide three lanes in each direction.

Stage III construction will consist of widening the section constructed under Stage II by 12 feet on the inside in each direction and adding curb and gutter to the inside. This will provide four lanes in each direction separated by a 22-foot median.

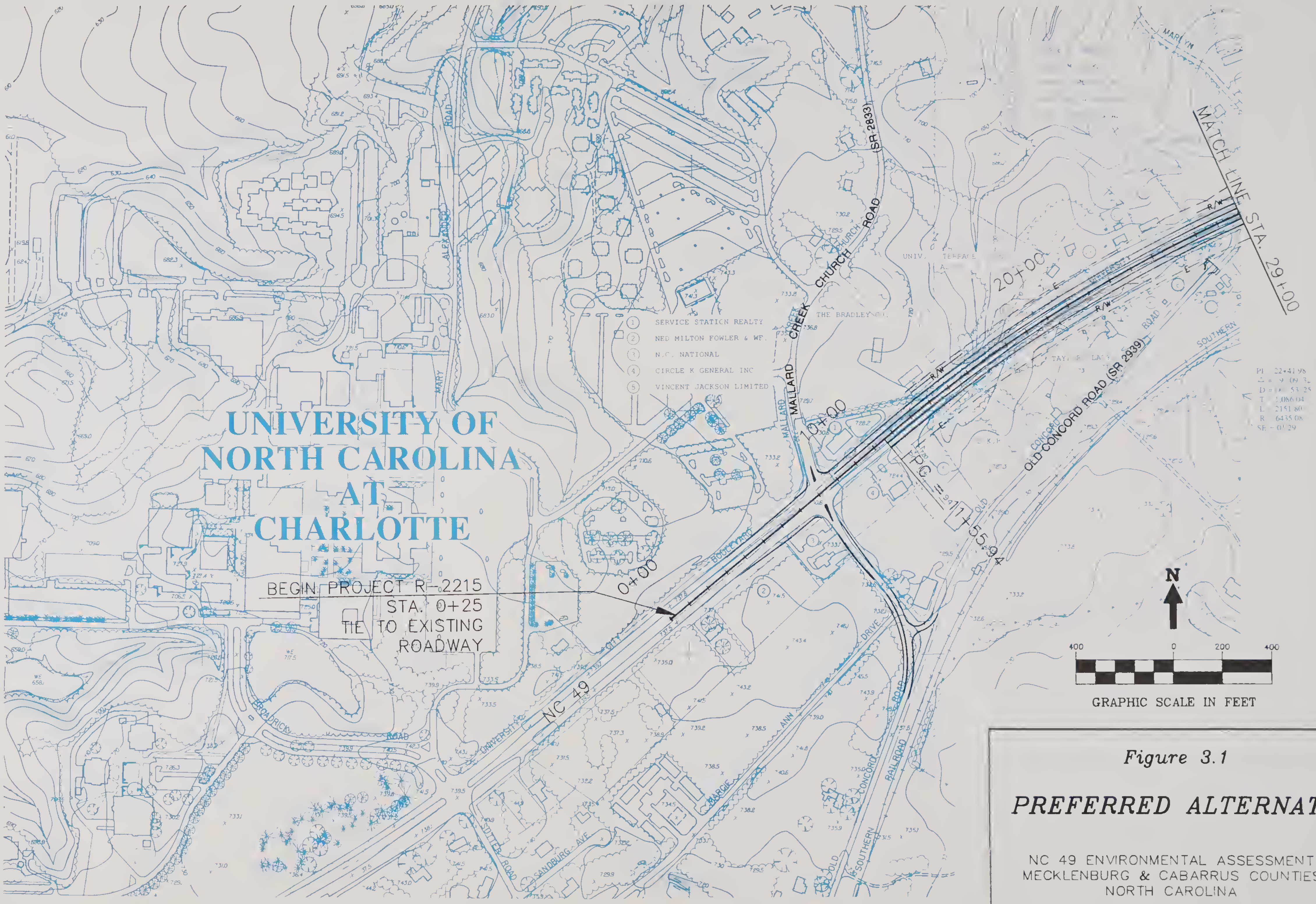


Figure 3.1

PREFERRED ALTERNATE

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

SHEET OF 5

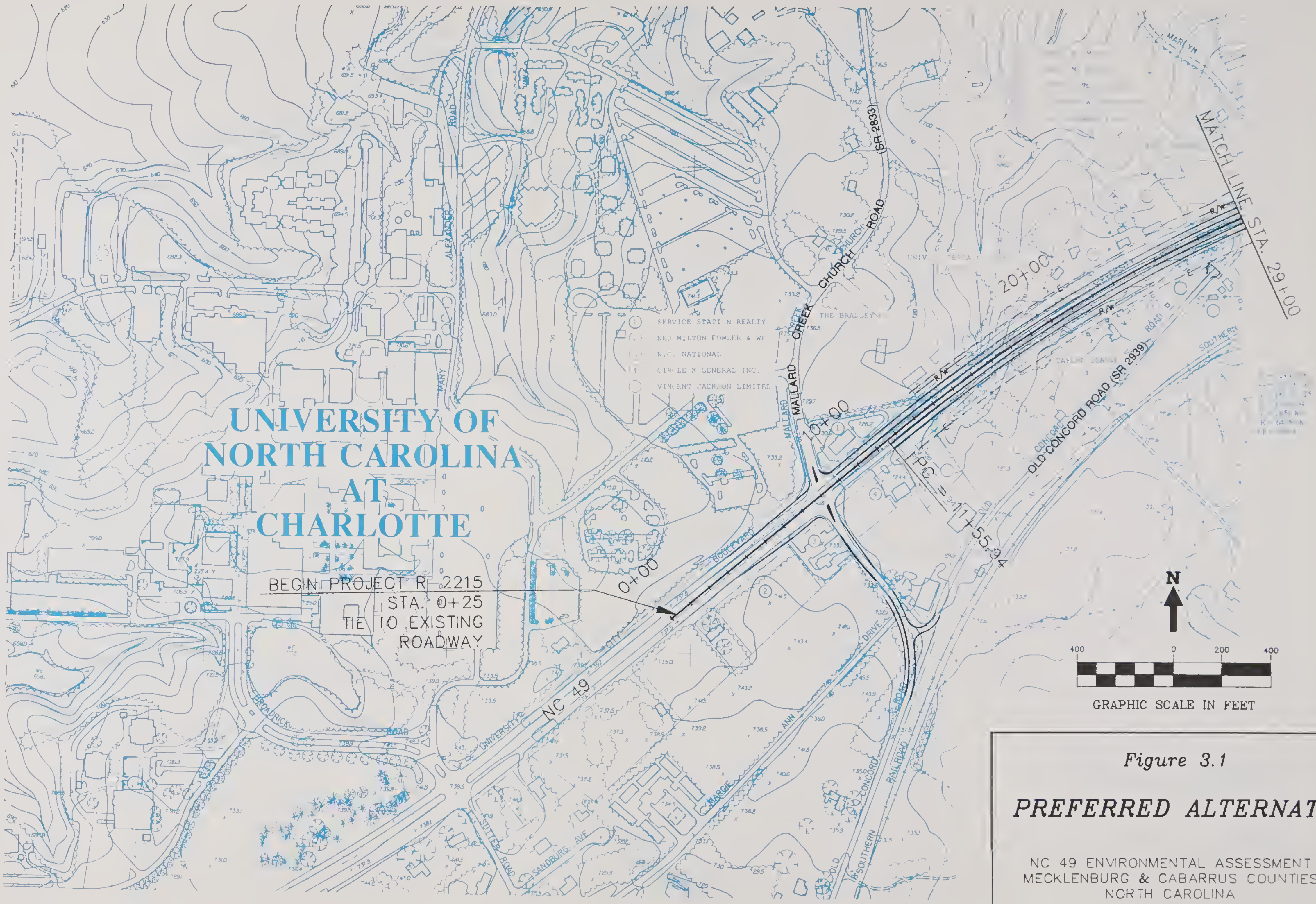


Figure 3.1

PREFERRED ALTERNATE

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

SHEET [illegible] OF 5

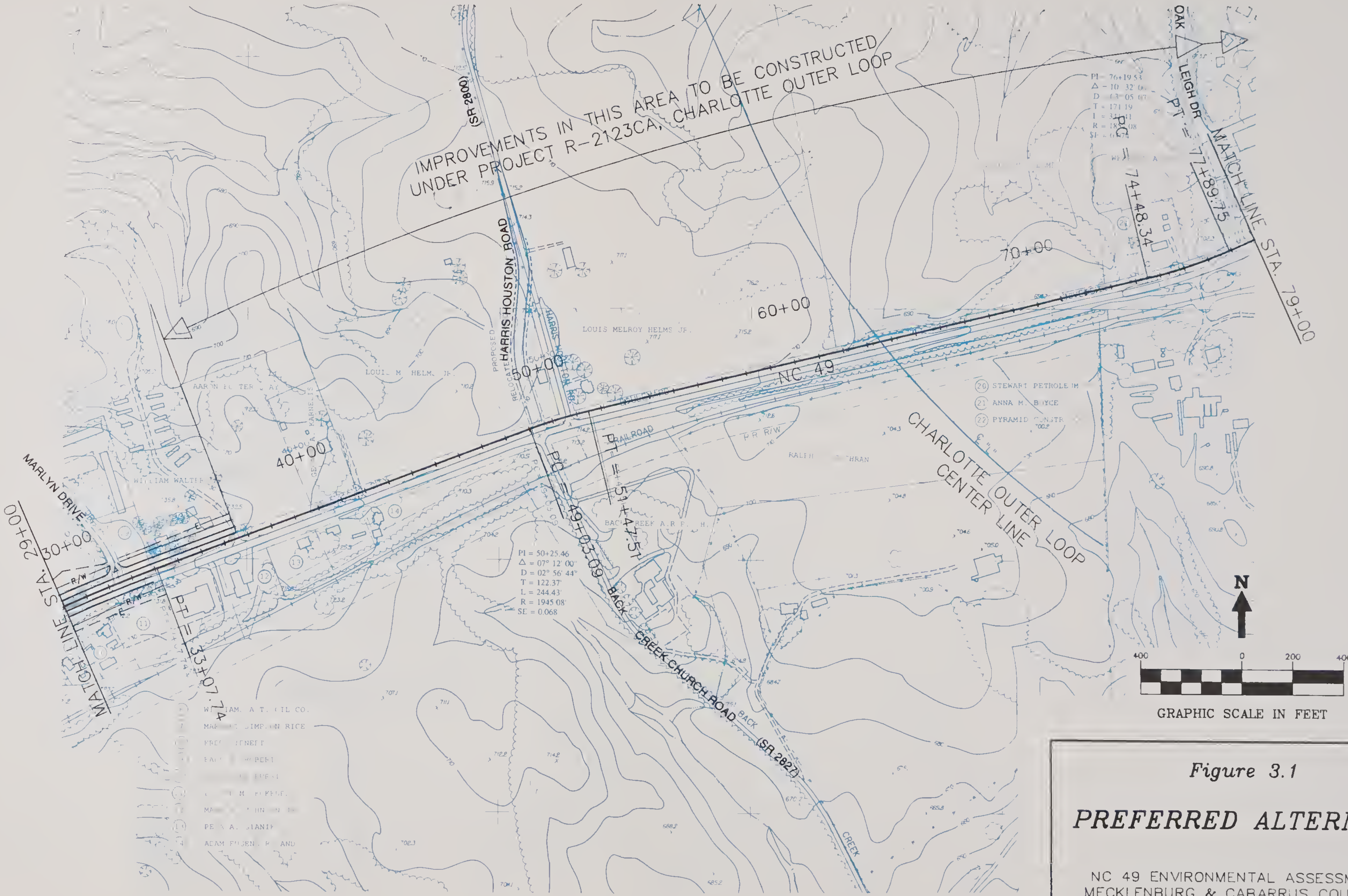


Figure 3.1

PREFERRED ALTERNATE

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

SHEET 2 OF 5

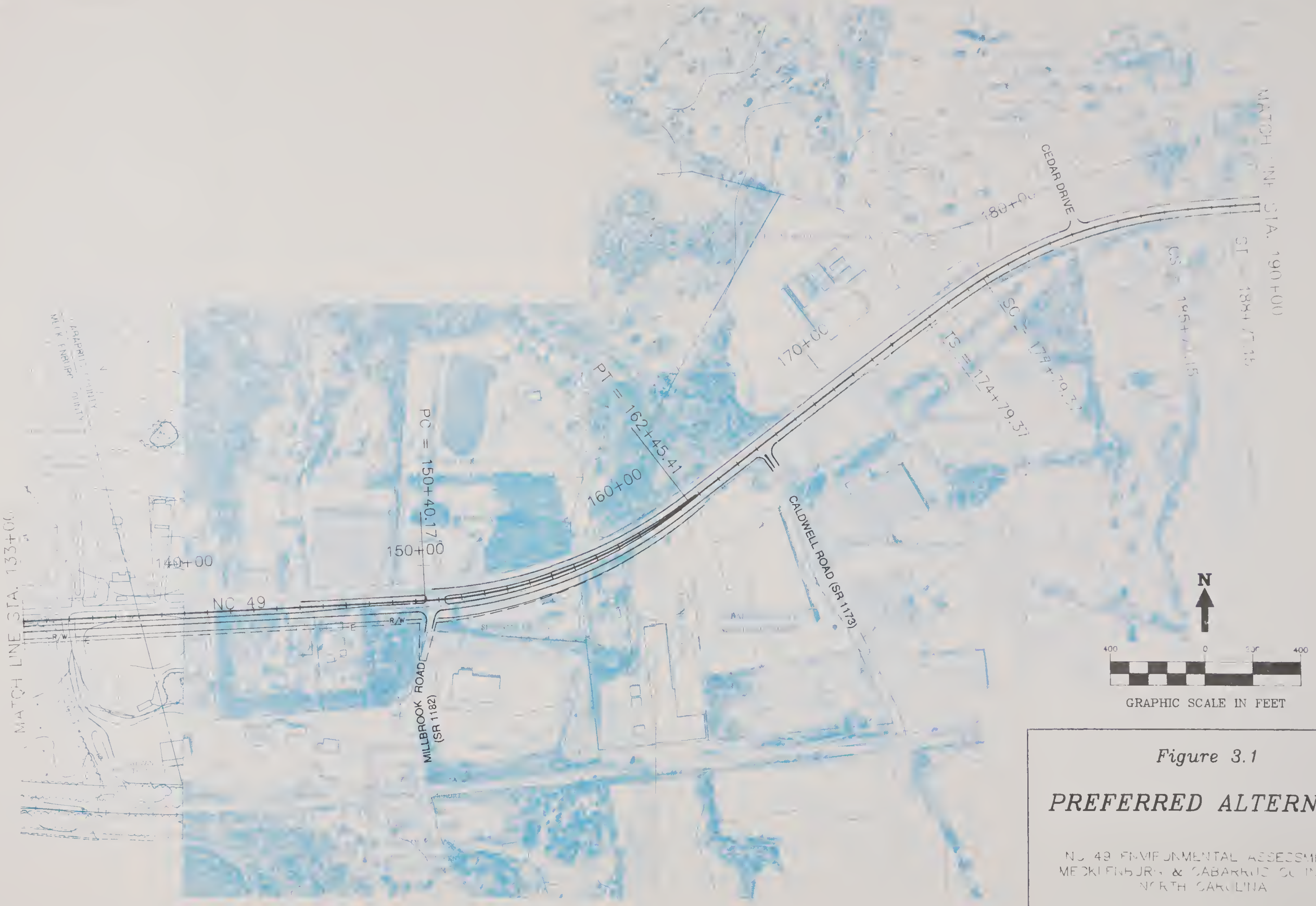


Figure 3.1

PREFERRED ALTERNATE

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

SHEET 4 OF

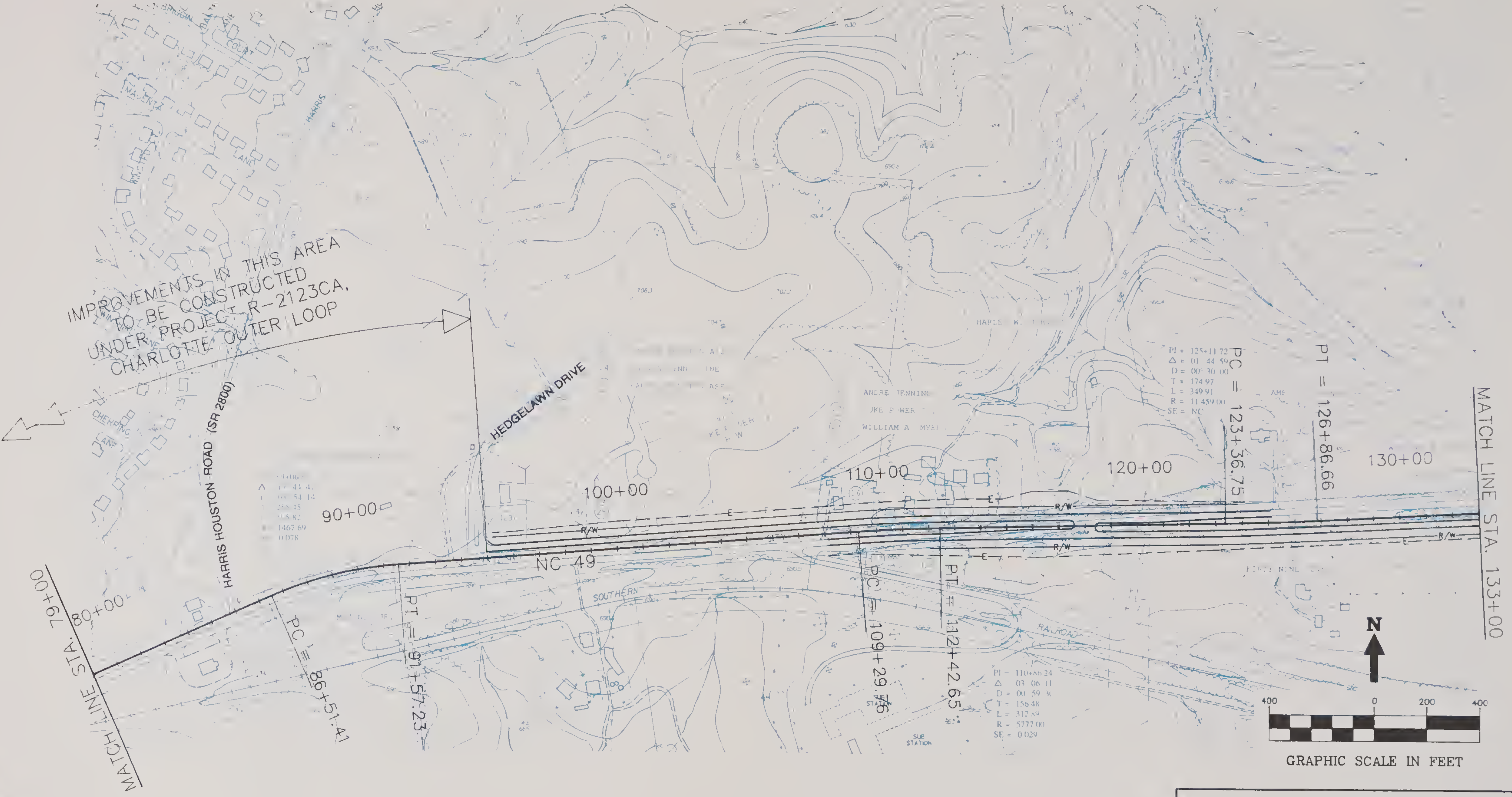


Figure 3.1

PREFERRED ALTERNATE

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

SHEET 3 OF 5

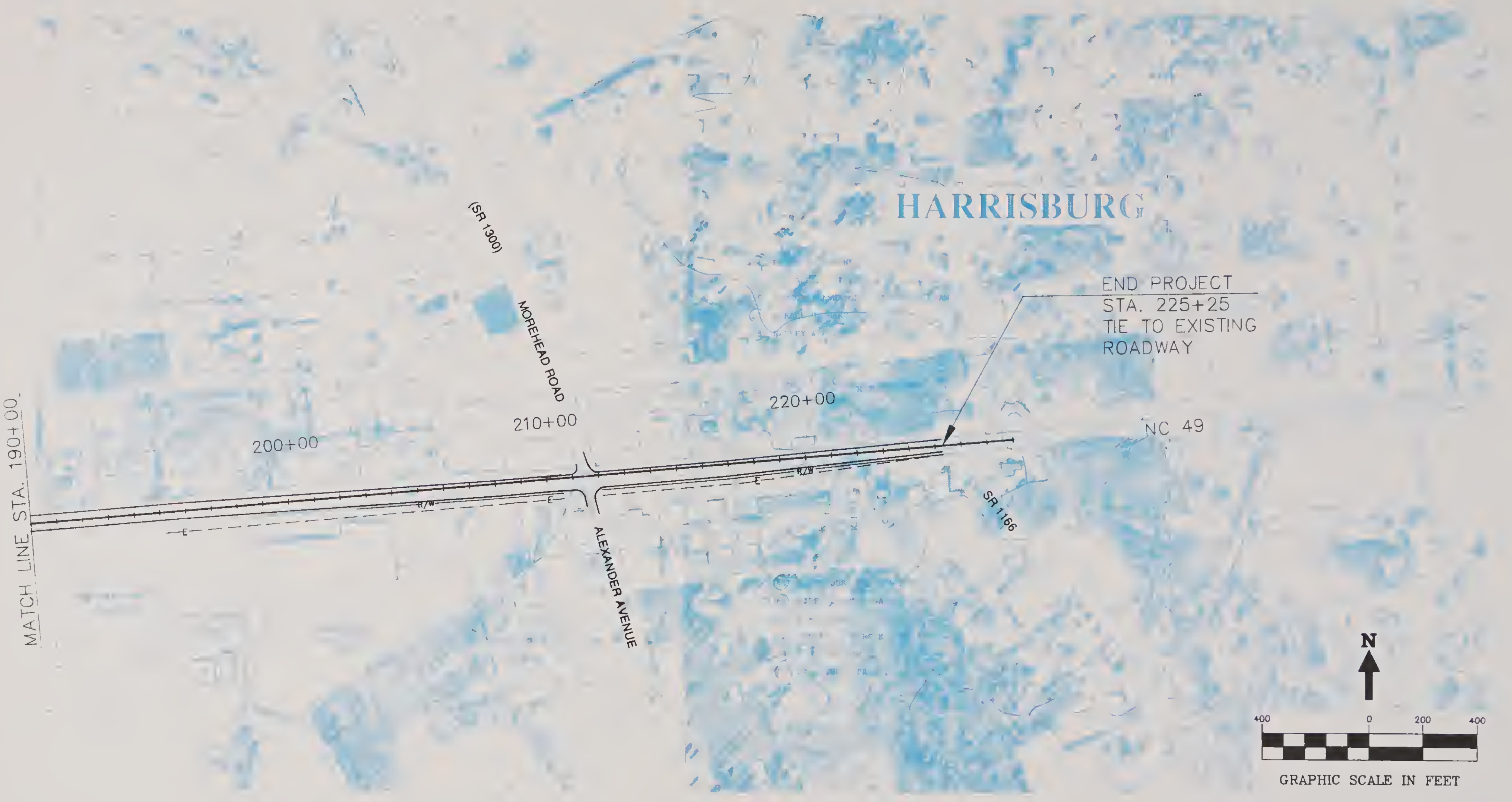
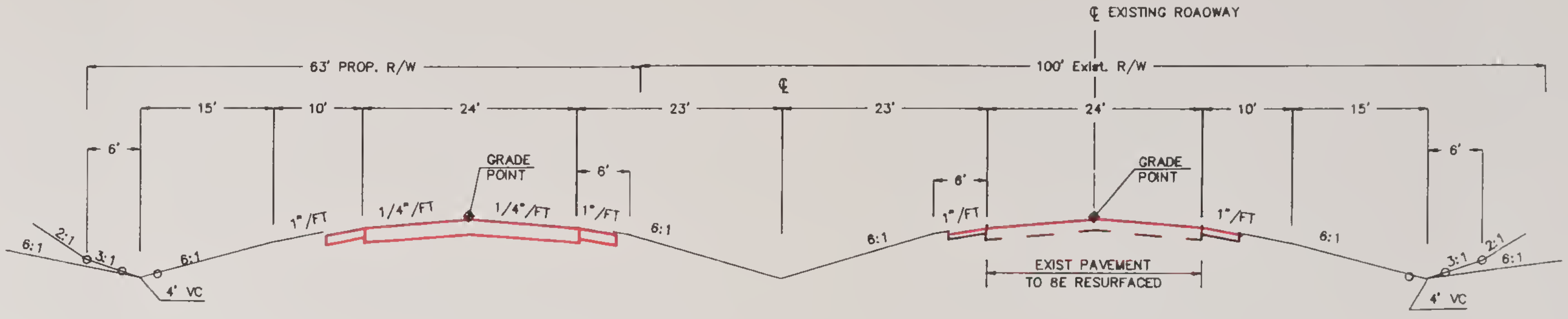


Figure 3.1

PREFERRED ALTERNATE

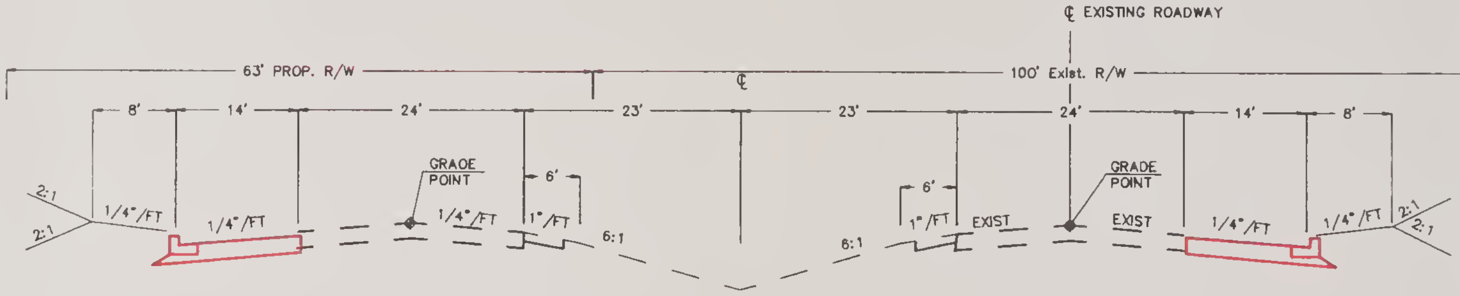
NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

SHEET 5 OF 5



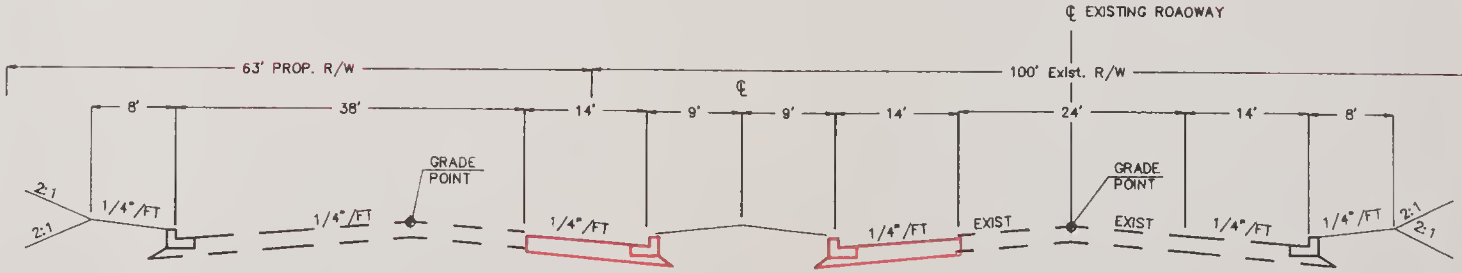
STAGE I

FOUR-LANE DIVIDED



STAGE II

SIX-LANE DIVIDED



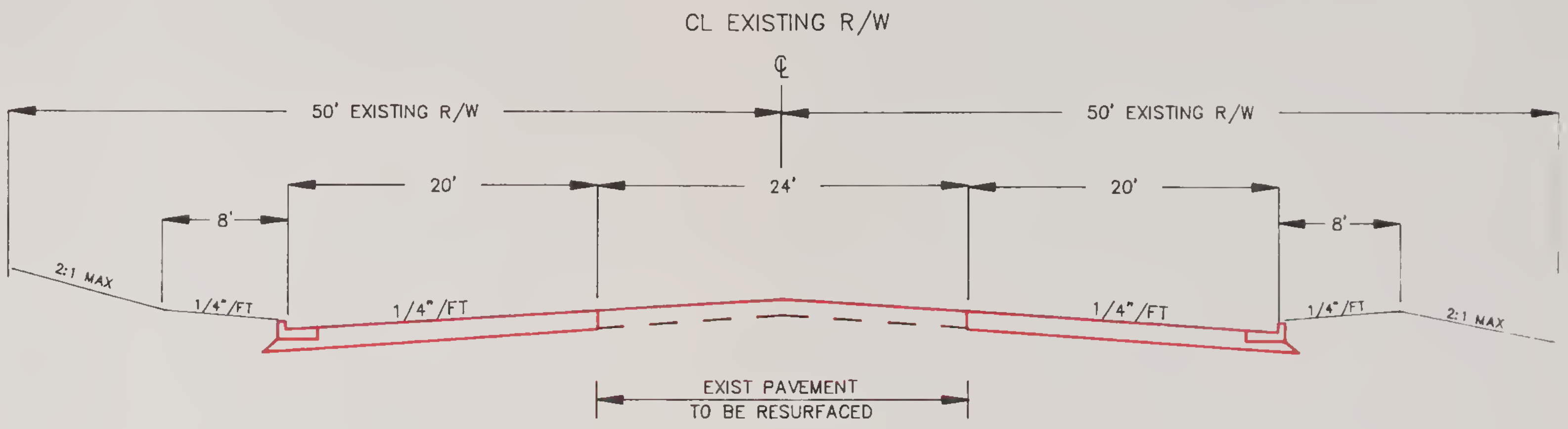
STAGE III

EIGHT-LANE DIVIDED

Figure 3.2

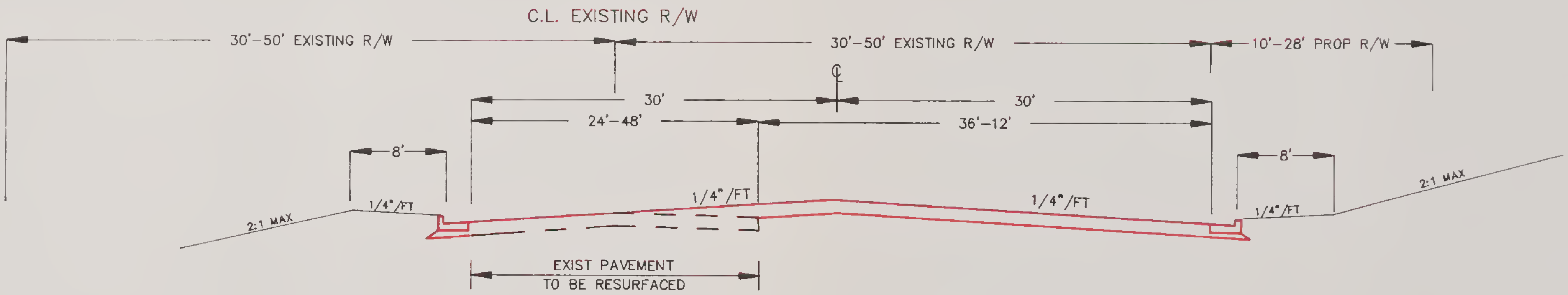
TYPICAL SECTIONS (STAGED CONSTRUCTION)

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA



URBAN FIVE LANE

SYMMETRICAL WIDENING



URBAN FIVE LANE

WIDENING TO THE SOUTH

Figure 3.3

TYPICAL SECTIONS (FIVE LANES)

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

The five-lane section from approximately 400 feet west of Caldwell Road (SR 1173) to approximately 1,600 feet west of Morehead Road (SR 1300) will consist of widening 18 feet to the north and south side of the existing roadway with curb and gutter on both sides. This will provide two lanes in each direction with a center turn lane.

The five-lane section from approximately 1,600 feet west of Morehead Road (SR 1300) to SR 1168, will transition from widening on both sides to widening to the south to avoid the Harrisburg Presbyterian Church Cemetery, located at the northwest corner of the intersection of NC 49 and Morehead Road (SR 1300). Widening would vary from 36 feet to 12 feet of additional pavement along the south side of the existing roadway. Curb and gutter will be constructed on both sides of the roadway. This will provide for two lanes in each direction with a center turn lane.

The design speed will be 60 miles per hour for the staged construction sections and 50 miles per hour for the five-lane sections.

3.3.3 Right of Way

Additional right of way will need to be acquired along the project except for the five-lane symmetrical widening section. The median divided section in the new alignment areas, at the beginning of the project and in the transition from widening to the north to widening to the south, requires a total right of way width of 156 feet. In the divided sections with widening to one side, an additional 63 feet of right of way will be required. In the five-lane section with widening to the south additional right of way required varies from 10 to 28 feet. In addition, right of way will be needed for the Old Concord Road (SR 2939) realignment at Mallard Creek Church Road (SR 2833). Construction easements along the project will also be required. The proposed right of way is shown along with the proposed alignment on Figure 3.1.

3.3.4 Pedestrian and Bicycle Facilities

Sidewalks will not be provided along this project. Consideration for providing crosswalks at signalized intersections will be addressed during the design stage.

No bicycle facilities are planned as part of this project. However, the Mecklenburg County Parks and Recreation Department have plans for a greenway to be located along Toby Creek that will intersect NC 49 approximately one mile west of this project. Greenways are designed to provide alternative pedestrian and bicycle routes through the community. In addition, students commuting by bicycle between UNCC and residential areas will travel along NC 49. To accommodate the potential bicycle traffic, four-foot paved shoulders will be provided in the rural section. In the curb and gutter section, the outside thru-lanes will be striped as 13-foot lanes to accommodate bicycle traffic, with the inside thru-lanes striped as 11-foot lanes as requested by the State Bicycle Coordinator (see letter in Appendix C).

3.3.5 Median Crossovers and Access Control

Median crossovers in the divided sections will be provided at Mallard Creek Church Road (SR 2833), Marlyn Drive (SR 4546), and Millbrook Road (SR 1182) with two additional crossovers between east Harris Houston Road (SR 2800) and Millbrook Road. Final location of median crossovers will be determined during the design stage. However, median crossovers should be spaced at a minimum of 1,500 feet.

There is currently no access control along this section of NC 49. The proposed project will not change the access control except at Old Concord Road (SR 2939), which will become a dead-end street at NC 49 and be realigned at Mallard Creek Church Road (SR 2833).

3.3.6 Intersections and Interchange

The intersections of NC 49 with Mallard Creek Church Road (SR 2833), Caldwell Road (SR 1173) and Morehead Road (SR 1300) were analyzed. Stage I improvements at these signalized intersection includes providing right and left turn storage lanes and tapers as shown in Table 3.1.

Improvements to NC 49, including an interchange with the Charlotte Outer Loop, from approximately 1,200 feet west of Back Creek Church Road (SR 2827) to Hedgelawn Drive will be constructed under project R-2123CA, Charlotte Outer Loop.

3.3.7 Permits

This project is expected to qualify for a Nationwide permit under activity number 14 of Section 404 of the Clean Water Act of 1977.

3.4 Cost Estimates

The estimated construction cost is $5,100,000. The estimated right of way cost, which includes the cost of relocating residences and businesses, is $5,045,000, providing a total cost of $10,145,000. These costs, in 1990 dollars, are based on preliminary studies and are subject to change during final design. The 1991-1997 TIP cost is $8,860,000.

3.5 Design Criteria

The design year for the project is 2015. The maximum superelevation rate is 0.08 ft./ft. for the median divided sections (60 mph design speed) and 0.06 ft./ft. for the five-lane sections (50 mph design speed). The maximum degree of curvature for horizontal curves is 4° 45' for the median divided sections and 6° 45' for the five-lane sections. Spiral curves will be used on the new lanes where necessary. The maximum grade is 5.0 per cent for the median divided sections and 6.0 per cent for the five-lane sections. The rate of vertical curvature for the median divided sections is; sag 120-160, crest 190-310. The rate of vertical curvature for the five-lane sections is; sag 90-110, crest 110-160.

TABLE 3.1

PROPOSED INTERSECTION CONFIGURATIONS

INTERSECTION/APPROACH (NC 49 EB & WB)	# LANES - MOVEMENT (L-Left, T-Through, R-Right)
Mallard Creek Church Road (SR 2833)	
EB	2-L, 2-T, 1-R
WB	1-L, 2-T, 1-R
NB	1-LT, 1-R
SB	1-L, 1-T,1-R
Caldwell Road (SR 1173)	
EB	1-T, 1-TR
WB	1-L, 2-T
NB	1-L, 1-R
Morehead Road (SR 1300)	
EB	1-L, 1-T, 1-TR
WB	1-L, 2-T, 1-R
NB	1-L, 1-TR
SB	1-L, 1-TR

3.6 Traffic Analysis

A traffic analysis was performed to evaluate the operational characteristics and determine the overall effectiveness of the Preferred Alternate as defined in Section 3.3. The analysis examines the operation of NC 49 under staged construction and evaluates the capacity of signalized intersections in the project area. The analysis was conducted in accordance with the procedures outlined in the *Highway Capacity Manual*, Special Report 209. The analysis of operational conditions at signalized intersections under staged construction was performed using Signalized Intersection Planning Analysis (SIPA), a supplemental program to the FHWA Highway Capacity Software. SIPA permits the analysis of future conditions for an intersection, using future traffic volumes and known geometrics, without the detailed specifics of signal operation. The analysis provides a general assessment of whether or not capacity would be exceeded under future conditions.

Stage I: Under Stage 1 construction, NC 49 would be improved to a four-lane divided highway from Mallard Creek Church Road (SR 2833) to Caldwell Road (SR 1173) and to a five-lane urban section from Caldwell Road to the end of the project in Harrisburg. Assuming implementation of these improvements and projected 1995 traffic volumes, the proposed project would operate at an overall level of service "C" or better (Table 3.2). The results of the capacity analysis performed for signalized intersections indicate that two of the intersections, NC 49 at Morehead Road (SR 1300) and NC 49 at Caldwell Road, would operate well under capacity. The intersection of NC 49 and Mallard Creek Church Road would operate near capacity, although traffic on Mallard Creek Church Road is a major contributor to this determination.

Stage II: As stated in previous sections, the study area is projected to undergo tremendous growth by the design year (2015). Based on traffic projections, it was evident that, although 1995 traffic would operate at acceptable levels under Stage I construction, traffic levels would begin to deteriorate (LOS "E") by the year 2004. This inability to operate at an acceptable level of service necessitates additional improvement of NC 49

TABLE 3.2

1995 TRAFFIC VOLUMES AND LEVEL OF SERVICE ANALYSIS

NC49

From	To	Proposed Facility	1995 ADT	1995 Peak Hour Volume	V/C Ratio	Level of Service
Mallard Creek Church Rd.	Old Concord Rd.	4-lane divided	23,100	2,541	0.49	B
Old Concord Rd.	SR 4546	4-lane divided	26,700	2,937	0.57	C
SR 4546	Back Creek Church Rd.	4-lane divided	26,500	2,915	0.57	C
Back Creek Church Rd.	Harris Houston Rd. W.	4-lane divided	26,000	2,860	0.56	C
Harris Houston Rd. W.	SR 4617	4-lane divided	24,700	2,717	0.53	C
SR 4617	Harris Houston Rd. E.	4-lane divided	23,200	2,552	0.50	B
Harris Houston Rd. E.	Millbrook Rd.	4-lane divided	20,800	2,288	0.44	B
Millbrook Rd.	Caldwell Rd.	5-lane urban	21,000	2,310	0.53	C
Caldwell Rd.	Cedar Dr.	5-lane urban	21,500	2,365	0.54	C
Cedar Dr.	Ford St.	5-lane urban	22,000	2,420	0.56	C
Ford St.	SR 1300	5-lane urban	22,900	2,519	0.58	C

from a four-lane to a six-lane urban section (Stage II) by the year 2004. As a six-lane facility, NC 49 would operate at level of service "C" or better. Consideration should also be given at this point to upgrading NC 49 to a six-lane facility east of Mallard Creek Church Road (SR 2833).

The five-lane section in Cabarrus County would operate at level of service "E" by the year 2004, with traffic operations in the mainstream being very unstable. Any disruptions in traffic flow would result in queues being formed and rapid deterioration to level of service "F."

Since increasing the roadway width beyond the proposed five-lane section through Harrisburg is not feasible due to economic and physical considerations, an additional project designed to alleviate traffic congestion in Harrisburg should be implemented. Preliminary alignments for a relocation of NC 49 are currently under study by Cabarrus County officials and the Planning and Environmental Branch of NCDOT.

Stage III: Based on an analysis of design year (2015) traffic, the improvement of NC 49 to an eight-lane urban section would result in an acceptable level of service "D" or better (Table 3.3). The timetable for constructing this "ultimate" section would, in all likelihood, coincide with the completion of Charlotte's Outer Loop.

TABLE 3.3

2015 TRAFFIC VOLUMES AND LEVEL OF SERVICE ANALYSIS

NC49

From	To	Proposed Facility	2015 ADT	2015 Peak Hour Volume	V/C Ratio	Level of Service
Mallard Creek Church Rd.	Old Concord Rd.	8-lane divided	58,300	6,413	0.62	C
Old Concord Rd.	SR 4546	8-lane divided	67,100	7,381	0.72	D
SR 4546	Back Creek Church Rd.	8-lane divided	66,600	7,326	0.71	D
Back Creek Church Rd.	Harris Houston Rd. W.	8-lane divided	66,200	7,282	0.71	D
Harris Houston Rd. W.	SR 4617	8-lane divided	61,800	6,798	0.69	D
SR 4617	Harris Houston Rd. E.	8-lane divided	58,900	6,479	0.63	C
Harris Houston Rd. E.	Millbrook Rd.	8-lane divided	54,400	5,984	0.58	C
Millbrook Rd.	Caldwell Rd.	5-lane urban	54,800	6,028	1.38	F
Caldwell Rd.	Cedar Dr.	5-lane urban	55,800	6,138	1.41	F
Cedar Dr.	Ford St.	5-lane urban	56,800	6,248	1.44	F
Ford St.	SR 1300	5-lane urban	58,500	6,435	1.48	F

NC 49

FROM THE EXISTING FOUR LANE SECTION NEAR UNCC
TO APPROXIMATELY 1000 FEET EAST OF SR 1300 IN HARRISBURG
MECKLENBURG AND CABARRUS COUNTIES
FEDERAL-AID PROJECT NO. F-28-1(4)
STATE PROJECT NO. 8.1672601
T.I.P. NO. R-2215

Section 4

4.0 SOCIAL AND ENVIRONMENTAL IMPACTS

This section of the report discusses the potential impacts associated with the proposed widening of existing NC 49 from the four-lane section at UNCC to approximately 1,000 feet east of Morehead Road (SR 1300) in Harrisburg. Currently NC 49 is a two-lane rural highway. The project area consists primarily of agricultural and residential land uses. Commercial land use occurs in the Town of Harrisburg. The area is expected to undergo tremendous growth as the City of Charlotte continues to expand. The project's potential impacts on the social, economic, cultural, physical, and natural environments are analyzed below.

4.1 Land Use Impacts

The *2005 Generalized Land Use Plan* for Charlotte-Mecklenburg and land use plans for the Town of Harrisburg list improvements to NC 49 in the project area as an important tool for managing growth in the area. Widening the existing road to a multi-lane facility is consistent with the recommendations cited in the plans. Therefore, the proposed improvements are not expected to create any deviations from any existing and/or proposed land use plans. A composite of future land use maps from the *2005 Generalized Land Use Plan*, the *Northeast Mecklenburg District Plan,* and the *Harrisburg Land Development Plan* is shown on Figure 4.1.

4.1.1 Mecklenburg County

Future land use adjacent to NC 49 in Mecklenburg County can be categorized as follows: low-density residential, multi-family residential, institutional, and commercial.

Low-density residential land use will continue to be the predominant land use in the study area. (The term "low-density" refers to four dwelling units per acre or less). There are some areas of high-density single-family and multi-family land uses proposed in the study area. In concert with the continuing growth and

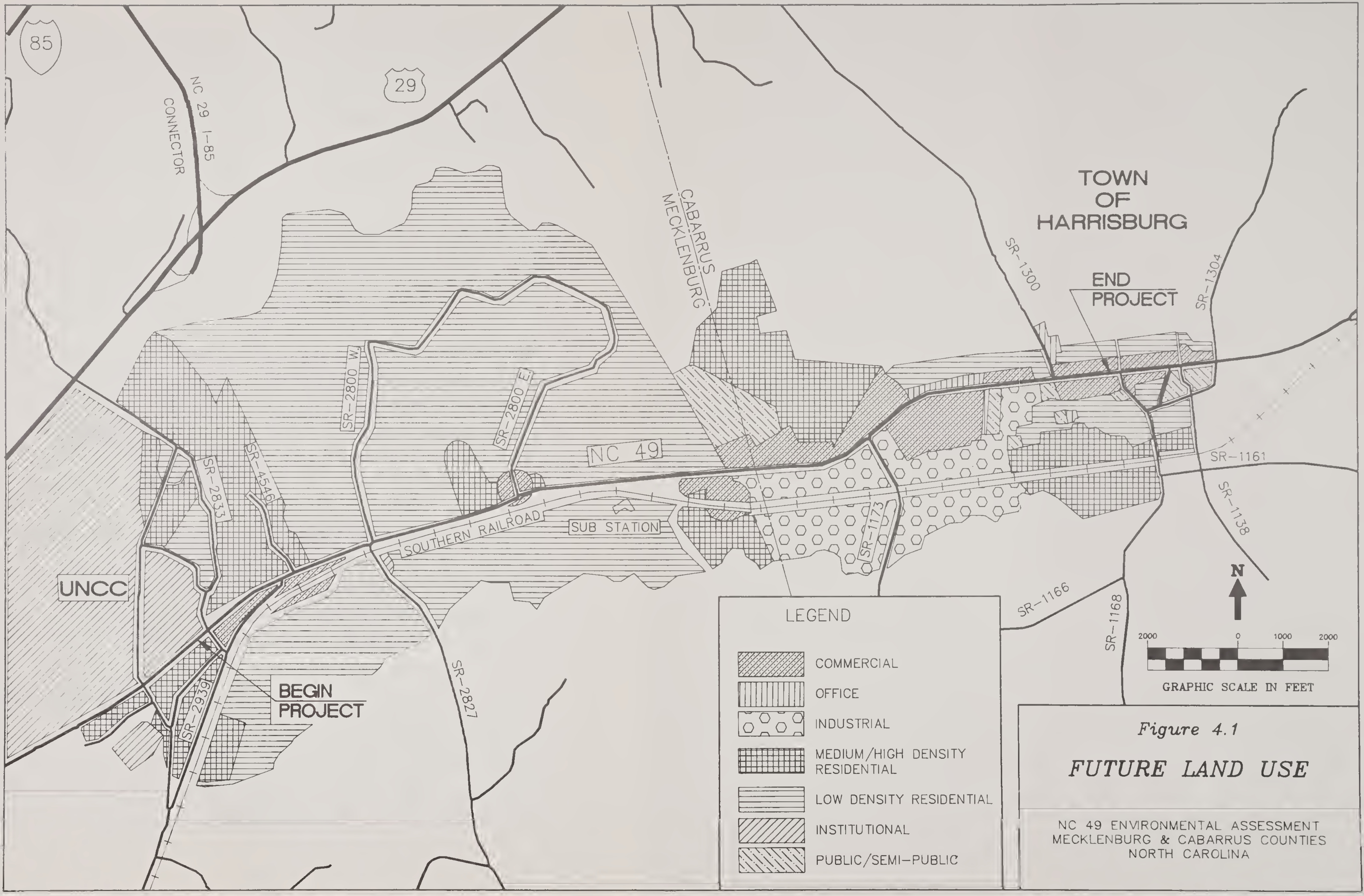


Figure 4.1

FUTURE LAND USE

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
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development of UNCC, high-density land uses will expand northeast of the campus along Mallard Creek Church Road (SR 2833), and south of the intersection of NC 49 and Mallard Creek Church Road. In addition, two other high-density residential areas are proposed for locations where land is already developed or appropriately zoned for multi-family use. These areas surround two neighborhood commercial centers proposed along NC 49.

Institutional land uses (UNCC) will include nearly all of the area located west and northwest of the intersection of NC 49 and Mallard Creek Church Road. A small pocket of institutional land use is also proposed for the southeast quadrant of the intersection of NC 49 and Back Creek Church Road (SR 2827).

Proposed commercial development in the study area will be concentrated in mixed use commercial centers in hopes of avoiding development of a "commercial strip" along NC 49. These centers will be located along NC 49 just west of the Cabarrus County line. A strip of commercial land uses is proposed along the south side of NC 49 extending from Mallard Creek Church Road east to a point just west of Back Creek Church Road.

With the area becoming more urbanized in nature and the planned improvement of NC 49 to a multi-lane facility, there will be considerable pressure to commercially develop the land adjacent to NC 49. Therefore, in some instances the existing zoning and proposed land use will conflict. Adherence to the land use plan and its policies will help ensure balanced growth in the study area.

4.1.2 Cabarrus County

Projected land use in Cabarrus County will become more diversified along NC 49 as it approaches the Town of Harrisburg. The types of land use that will be prevalent in the future include low-density residential, medium/high-density residential, general commercial, professional office, light industrial, and public/semi-public.

Low-density residential land use is the predominant land use in the Town of Harrisburg. Most of the residential properties do not abut NC 49, but are located one or two blocks to its north or south (the majority being to the north). There are also large areas of low-density residential land use outside the study area.

Three areas of medium to high-density residential development are proposed in the study area. These include: (1) An area north of NC 49 at the western limits of Harrisburg; (2) An area that occupies a large portion of property on both sides of the Norfolk Southern Railroad west of Robinson Church Road, and; (3) The area immediately south of NC 49 and east of School Circle Road. This last area was not considered to be located within the study area limits. These sites represent locations that may be suitable for multi-family development and fulfill a need to designate such areas in case of future demand.

The most prevalent land use directly abutting NC 49 in Harrisburg would be general commercial. Virtually all of the north side of NC 49 is projected for commercial use, while the south side contains a mixture of industrial, commercial, and some public/semi-public land uses.

Two areas proposed for office-type developments were identified in the project area. These areas would be compatible with proposed commercial land uses. One area located along NC 49 between Cedar Drive and Ford Street would serve as a buffer between the commercial and industrial areas to the south and the residential areas to the north. Another area projected for office development would be located along the east side of Morehead Road between Morris Drive and Plaza Drive.

Light industrial development is also proposed in the study area. Most of this development is characteristic of an area that services a railroad

(Norfolk Southern Railway). Industrial uses would occupy nearly all of the area bordered by NC 49 to the north, Back Creek to the south, Morehead Road to the east, and the Mecklenburg County line to the west.

Proposed public/semi-public land uses are scattered throughout the study area. The two most prominent areas would be located just north of NC 49 at the Mecklenburg County line and just south of NC 49 west of School Circle Road.

4.2 Prime and Important Farmlands

The proposed action will not impact any prime or important farmland in Cabarrus County. Therefore, this section only addresses impacts in Mecklenburg County.

Mecklenburg County contains 231,800 acres of farmland as defined in the Farmland Protection Policy Act of 1981 (FPPA). Approximately 20,000 acres of this farmland was harvested in 1990. Corn, soybean, and small grain were the major crops.

Prime and state/locally important farmlands are mapped in a report called *Important Farmlands of Mecklenburg County, North Carolina.* The prime and important farmlands located within the project study area are shown in Figure 4.2. The project will not impact any farmland that meets the criteria for designation as prime or unique farmland. However, the project will result in the direct conversion of approximately 5.26 acres of state/locally important farmland. Approximately 50 percent of this area contains active farm sites.

Form AD 1006 (Appendix "A") was completed for four preliminary alternatives including the Preferred Alternate (Site "C" on the form). Each site was evaluated and assigned a score that was used to determine the suitability of the site for protection as a farmland. The criteria used in assigning scores included soil productivity, project compatibility, impacts to active farming operations, state and local protection policies/programs, and impacts on farm support services. The U.S. Department of Agriculture recommends that

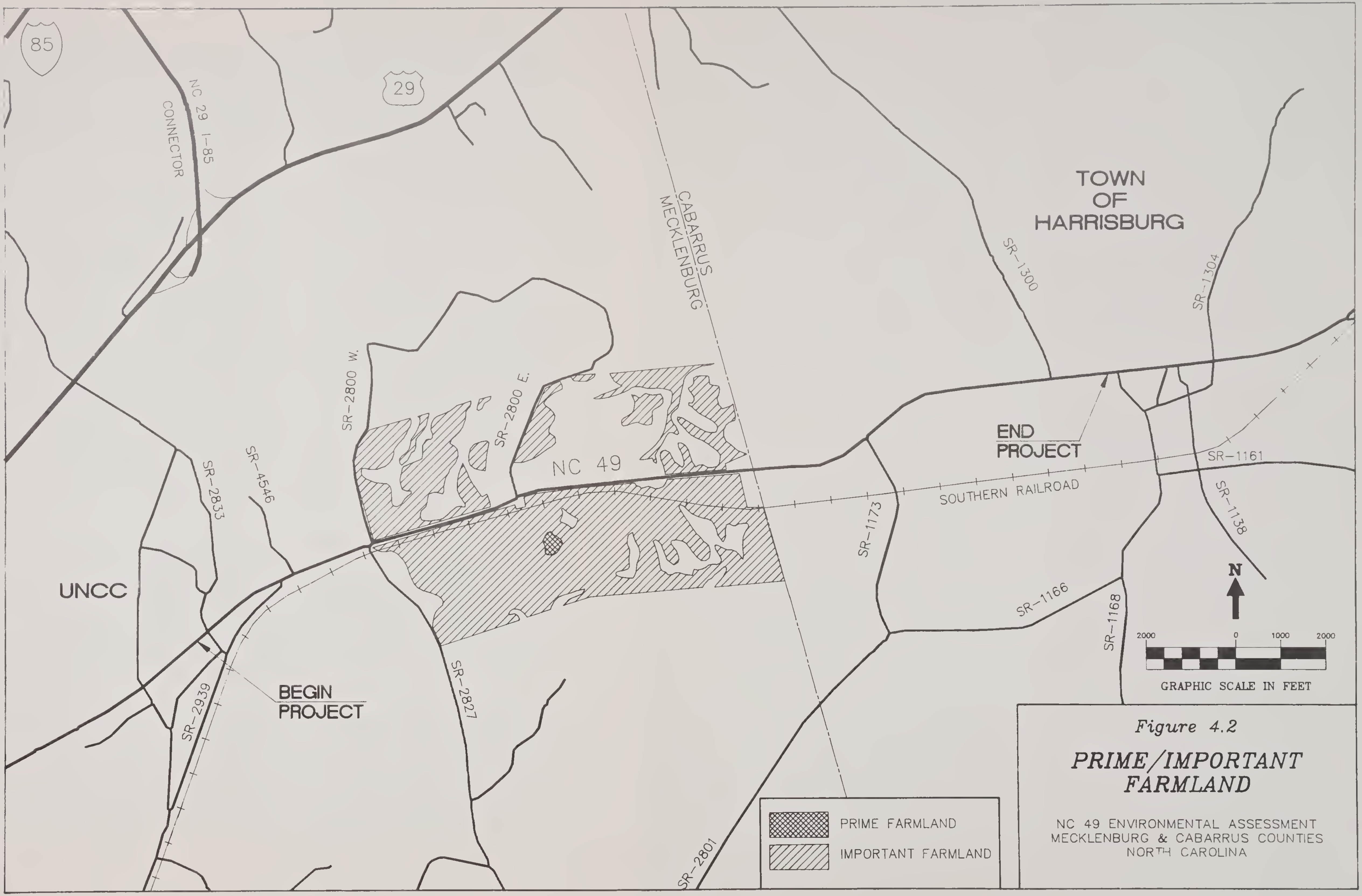

Figure 4.2

PRIME/IMPORTANT FARMLAND

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NORTH CAROLINA

sites receiving a score of less than 160 be given a minimal level of consideration for protection and that no additional sites be evaluated. All four sites received scores that were less than 160. The Preferred Alternate received a score of 122. There is no significant difference between the alternatives in terms of impacts to important farmlands.

4.3 Socioeconomic and Community Impacts

4.3.1 Neighborhoods

The study area, with the exception of the Town of Harrisburg, consists primarily of individual residences scattered along NC 49 and several new residential communities or subdivisions set back from the roadway. Because of the railroad corridor south of NC 49 and other factors, the majority of these communities occur north of the proposed project. The transition from isolated single-family residences to residential communities can be attributed to the intense growth of the area as Charlotte continues to expand, and to the planned construction of the Charlotte Outer Loop. Completion of the Outer Loop will make this area more accessible to Charlotte, Pineville, and most of Mecklenburg County.

The impact of the proposed project on established neighborhoods was assessed in terms of the degree in which the proposed improvements would disturb the integrity of an identified neighborhood. The integrity of a neighborhood was considered to be disturbed if certain elements that give a neighborhood it's character are displaced or if a neighborhood is divided so that one area is isolated from the remainder of the neighborhood.

Since the proposed project concerns only the widening of an existing facility and does not address the construction of a new alignment, there would not be any neighborhoods either divided or disturbed. As a result, the proposed project is not expected to adversely impact any of the established neighborhoods in the study area even though some homes will be acquired for right of way.

4.3.2 Change In Travel Conditions

The proposed widening of NC 49 would effectively bring about a number of changes in travel conditions for the study area. The project would improve accessibility between the City of Charlotte and Harrisburg. On a smaller scale, the project would also improve accessibility to a number of regional trip generators such as UNCC, University Research Park, and the Charlotte Motor Speedway. In addition to improving accessibility in the area, the proposed project would also improve travel time for motorists and traffic safety in the corridor.

By improving accessibility, the project may also have a negative impact on travel conditions. The project would in all likelihood increase the potential for new residential, industrial, and commercial development along NC 49. Although these factors would enhance employment opportunities in the area, the overall result would be increased traffic congestion. With this increased growth potential, a major concern along NC 49 would be the placement of median openings and the location of property access driveways, subdivision entrances and minor cross streets.

4.3.3 Effects on Social Groups

The project will not adversely affect any social groups, including the elderly, handicapped, nondrivers, transit dependent, or minority and ethnic groups. The project would have the potential to benefit unemployed persons in the study area, especially in Cabarrus County. Improving NC 49 to a multi-lane facility and thereby improving accessibility to downtown Charlotte would have the potential for attracting new businesses and industries to the region. This new growth would result in more economic diversification so that the economy of this area does not have to rely strictly on manufacturing and textile employment opportunities.

4.3.4 Relocation Impacts

The project will displace five families and three businesses. No non-profit organizations or farms will be taken. A copy of the Relocation Report prepared by NCDOT Right of Way Branch is included in Appendix "B" of this document.

It is the policy of the NCDOT to ensure that comparable replacement housing would be available prior to construction of federally assisted projects. Furthermore, the North Carolina Board of Transportation has the following three programs to minimize the inconvenience of relocation:

- Relocation Assistance
- Relocation Moving Payments, and
- Relocation Replacement Housing Payments or Rent Supplement.

Within the Relocation Assistance Program, experienced NCDOT staff will be available to assist displacees with information such as availability and prices of homes, apartments, or businesses for sale or rent, financing or other housing programs. The Relocation Moving Payments Program, in general, provides for payment of actual moving expenses encountered in relocation. Where displacement will force an owner or tenant to purchase or rent property of higher cost or to lose a favorable financing arrangement (in cases of ownership), the Relocation Replacement Housing Payments or Rent Supplement Program will compensate owners who are eligible and qualify up to $22,500, and tenants who are eligible and qualify up to $45,250.

The relocation program for the proposed action will be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), and the North Carolina Relocation Assistance Act (GS-133-5 through 133-17). The program is designed to provide assistance to displaced persons in relocating to a replacement site in which to live or conduct business. At least one relocation officer is assigned to each highway project for this purpose.

The relocation officer will determine the needs of displaced families, individuals, businesses, non-profit organizations, and farm operations for relocation assistance advisory services without regard to race, color, religion, sex, or national origin. The NCDOT will schedule its work so to allow ample time, prior to displacement, for negotiations and possession of replacement housing which meets decent, safe, and sanitary standards. The displacees are given at least a 90-day written notice after NCDOT purchases the property. Relocation of displaced persons will be offered replacement property in areas generally not less desirable in regard to public utilities and commercial facilities. Rent and sale prices of replacement housing offered will be within the financial means of the families and individuals displaced, and be reasonably accessible to their places of employment. The relocation officer will also assist owners of displaced businesses, non-profit organizations, and farm operations in searching for and moving to replacement property.

All tenant and owner residential occupants who may be displaced will receive an explanation regarding all available options, such as (1) purchase of replacement housing, (2) rental of replacement housing, either private or public, or (3) moving existing owner-occupant housing to another site (if possible). The relocation officer will also supply information concerning other state or federal programs offering assistance to displaced persons and will provide other advisory services as needed in order to minimize hardships to displaced persons in adjusting to a new location.

The Moving Expense Payments Program is designed to compensate the displacee for the costs of moving personal property from homes, businesses, non-profit organizations, and farm operations acquired for a highway project. Under the Replacement Program for Owners, NCDOT will participate in reasonable incidental purchase payments for replacement dwellings such as attorney's fees, surveys appraisals, and other closing costs and, if applicable, make payments for any increases in interest expenses for replacement dwellings. Reimbursement to owner-occupants for replacement housing payments, increased interest payments, and incidental purchase expenses may not exceed $22,500 combined total.

A displaced tenant may be eligible to receive a payment, not to exceed $5,250, to rent a replacement dwelling or to make a down payment, including incidental expenses, on the purchase of a replacement dwelling. The down payment is based upon what the state determines is required.

It is a policy of the state that no person will be displaced by the NCDOT's federally-assisted construction projects unless and until comparable or adequate replacement housing has been offered or provided for each displacee within a reasonable period of time prior to displacement. No relocation payment received will be considered as income for the purposes of the Internal Revenue Code of 1954 or for the purposes of determining eligibility for the extent of eligibility of any person for assistance under the Social Security Act or any other federal law.

Last Resort Housing is a program used when comparable replacement housing is not available or when it is unavailable within the displacee's financial means, and the replacement payment exceeds the federal and state legal limitation. The purpose of the program is to allow broad latitudes in methods of implementation by the state so that decent, safe, and sanitary replacement housing can be provided. It is not felt that this program will be necessary since it is used, as the name implies, only as a "last resort" and there appears to be adequate opportunities for relocation within the area. However, it will be available if necessary.

4.3.5 Economic Impacts

The project will improve access to and from employment activities in the Charlotte-Mecklenburg area. This improved access is expected to have a positive impact on growth in Mecklenburg and Cabarrus Counties. In addition, improvements to the existing road are expected to make the area more attractive to businesses. The project would be expected to have an overall positive impact on the local economy.

4.4 Historic and Archaeological Resources

A survey was conducted to locate existing historic architectural sites and to determine if any sites would be affected by the proposed project. The survey was conducted in compliance with Section 106 of the National Historic Preservation Act of 1966, the Advisory Council on Historic Preservation's Regulations For Compliance with Section 106, Codified As 36 CFR Part 800 and Section 4(f) of the Department of Transportation Act (23 CFR 771). The survey included a field investigation of all structures to identify any architectural resources which are currently on or are potentially eligible for nomination to the National Register of Historic Places. None of the sites inventoried are on or are eligible for the National Register of Historic Places. These findings have been coordinated with the North Carolina Department of Cultural Resources and the State Historic Preservation Officer has concurred. Copies of concurrence letters are contained in Appendix C.

An archaeological survey of the project area was conducted for the recent East Charlotte Outer Loop Environmental Impact Statement (EIS). The results of this survey indicated that one site located at the proposed crossing of the Outer Loop with NC 49 would be impacted. However, this site is located outside the proposed right of way for NC 49. This site, identified as 31MK417, will be tested to determine if it should be recommended for inclusion on the National Register of Historic Places or is subject to Section 106 Mitigation Measures. The archaeological site testing will be conducted after right of way acquisition for the Charlotte Outer Loop. For further reference, the East Charlotte Outer Loop EIS should be consulted. Additional archaeological investigations were not conducted for this project based on coordination with the North Carolina Department of Cultural Resources and the State Historic Preservation Officer. Scoping comments are contained in Appendix C.

4.5 Visual Impacts

The visual impacts associated with the widening of an existing roadway are usually less severe than those impacts associated with the construction of a new roadway. The basic landscape of the study area, with the exception of the Town of Harrisburg, is a rural setting with broad, gently rolling uplands. In terms of landcover, the study area consists of upland forest, fragmented by agricultural fields, rural residential areas, and scattered commercial and industrial development. Small areas of mature forest also occur in the study area, usually near stream heads and on slopes too steep to farm.

Improving the existing facility would generally have a low adverse impact upon the quality of views from the roadway. Since scattered commercial and industrial development already occur in the study area, drivers are not afforded views of large scenic expanses. Every effort should be made to ensure that some areas of open space be maintained either to preserve agricultural areas or to provide for recreational uses. In addition, land use controls should be followed to ensure that new developments in the study area are properly landscaped and aesthetically acceptable.

The proposed project would also have little adverse impact on the view available to residents along NC 49. The visual extent of the facility would certainly increase due to increasing the pavement width and eliminating existing roadside vegetation. However, the majority of older residences and newer subdivision communities are located well back from the roadway.

4.6 Physical Environment Impacts

4.6.1 Topography, Geology and Soils

Mecklenburg and Cabarrus Counties, North Carolina, lie within the Piedmont physiographic region. Topographically, the project area is characterized by broad, gently rolling uplands. Drainage networks are cut by relatively steep slopes. Elevations along the project area range between 660 and 730 feet above sea level, with the highest point at the beginning of the project in Mecklenburg County and the lowest point near the Mecklenburg/Cabarrus County line.

From the western project terminus eastward to the Mecklenburg/Cabarrus County line, the Charlotte belt consists of intensive, metamorphosed, foliated to massive quartz diorite. A small portion of the project area west of Harrisburg is underlain by metamorphic, metavolcanic, interbedded felsic to mafic tuffs and flowrock. The eastern section of the project area, including Harrisburg, is underlain by intrusive, metamorphosed mafic rock: metagabbro, metadiorite, and mafic plutonic-volcanic complexes.

Soils in the project area range from moderately well drained to well drained loams to sandy loams with a predominantly clayey subsoil. Broad upland ridges are dominated by Enon, Iredell, and Mecklenburg series soils. Wilkes and Enon series soils predominate on side slopes, and Chewacla soils are found in stream floodplains. These soils are not hydric, and only Chewacla is likely to have hydric inclusions.

Iredell-Mecklenburg Series soils consist of IrA, IrB, IuB, MeB, MeD, and MkB soil types. This series is characterized by moderately well-drained, nearly level to strongly sloping soils, which have a predominantly clayey subsoil. These soils originate as saprolitic material from the diorite, gabbro and as diagenetic products of other ferromagnesian minerals. The Iredell-Mecklenburg soils are predominant in the study area.

Wilkes-Enon Series soils consist of sloping, well-drained soils and occur at the beginning of the study area. This series, which comprises WkB, WkD, WkE, WkF, WuD, EnB, and EnD soils, originates from the weathering products of diorites, hornblende schists, and other alkaline intrusives.

Enon-Mecklenburg-Poindexter Series soils consist of gently sloping to very steep, well drained soils that have a clayey or loamy subsoil. This series occurs along the project area in Cabarrus County and is made up of EnB, EnD, EoB, MeB, MeD, and MkB in the study area. These soils are formed in residuum from mixed acidic and basic igneous and metamorphic rock.

4.6.2 Mineral Resources

The location of mineral resources within the study area was determined in order to assess the potential impact of roadway construction on these resources. The location of mineral resource locations is largely dependent on soil types and geological composition. There is one active rock quarry in the vicinity of the study area. The Mallard Creek Quarry is located between US 29 and NC 49, south of the US 29/I-85 interchange and east of the UNCC campus. The quarry is owned by Martin-Marietta Aggregates. The land area within the property boundary is about 400 acres. The old quarry pit, before production ceased about 1979, occupied an area of about five acres. In August 1986, the North Carolina Department of Natural Resources and Community Development (DNRCD), Division of Land Resources, granted a mining permit for the operation of a crushed stone quarry that will be effective until August 1996. Development plans indicate expansion of the existing quarry pit by approximately 15 acres in a southwesterly direction within the next 10 years. Presently, the only access road to the quarry area connects with Mallard Creek Church Road (SR 2833). The proposed project would not impact the existing quarry or current expansion plans.

4.6.3 Surface Water Resources

4.6.3.1 Surface Hydrology

The proposed project is located in the upper basin of the Rocky River, the largest tributary of the Yadkin River. The Rocky River basin encompasses 1,448 square miles of the Charlotte and Carolina slate belts in the Piedmont province of North Carolina. The project is situated on the drainage basin divide between two Rocky River tributaries: Back Creek to the south, and Mallard Creek to the north. Rivers, streams, and creeks in the project area are shown on Figure 4.3.

Back Creek is located approximately 0.3 to 0.7 miles south of NC 49 within the study area, and the heads of several intermittent tributaries approach within a few hundred feet of the road. Mallard Creek is located

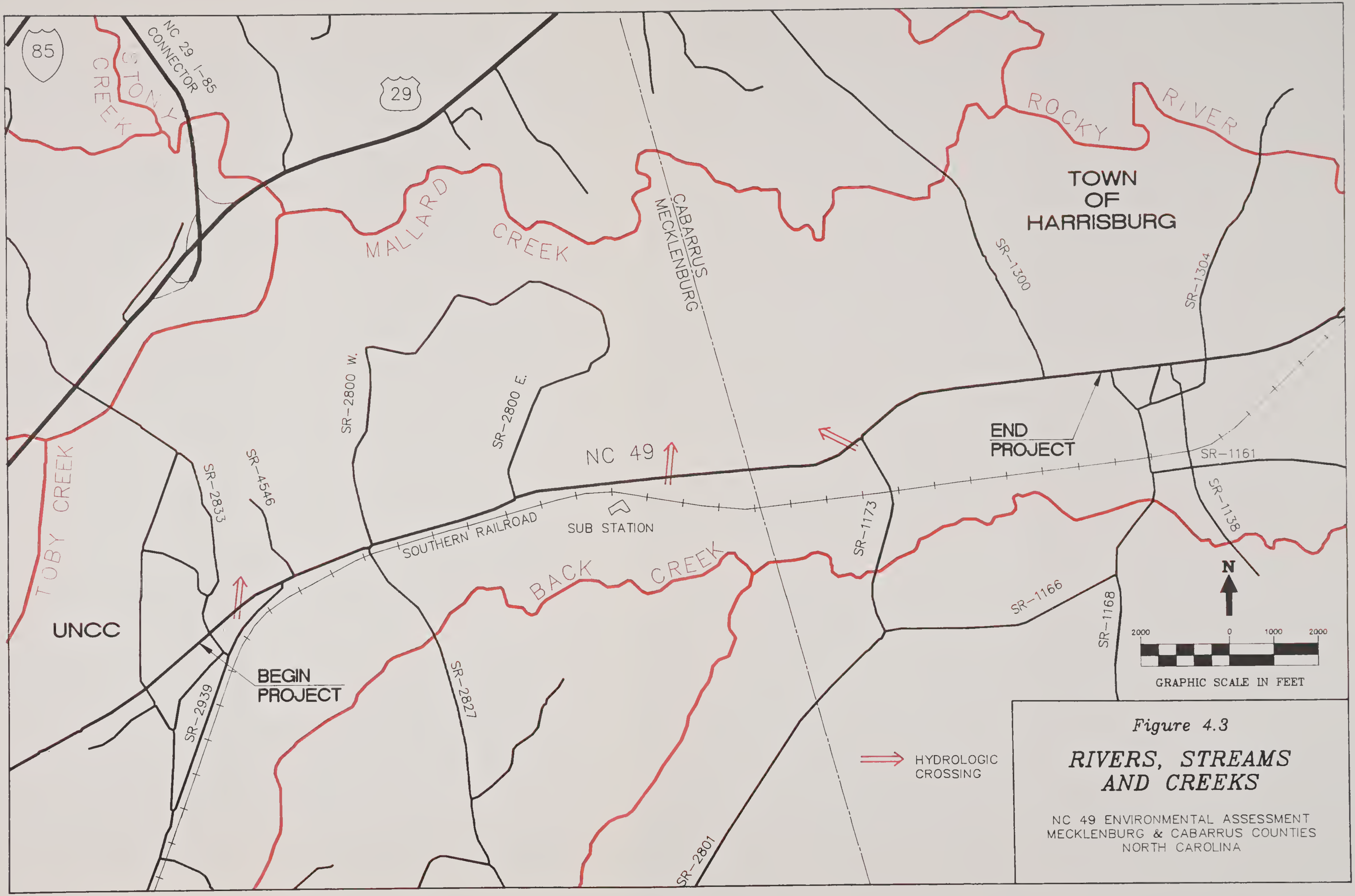

Figure 4.3

RIVERS, STREAMS AND CREEKS

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

approximately 0.7 to 1.4 miles north of NC 49, and also has intermittent tributaries near the road, including three that cross the road (See Figure 4.3).

One Mallard Creek tributary crosses NC 49 approximately 800 feet east of the intersection of Mallard Creek Church Road (SR 2833). North of NC 49, the channel is three to four feet wide, with sand and clay substrate, and distinct banks. The drainage basin area is approximately one square mile.

The second Mallard Creek tributary crosses NC 49 approximately 2,000 feet west of the Mecklenburg/Cabarrus county line. North of the road the channel is four feet wide, with an anoxic substratum of barnyard silt, and indistinct banks. South (upstream) of the road the channel is two feet wide, with a substratum of cobble, gravel, and exposed tree roots, and indistinct banks. The drainage basin area is less than one-half square mile.

The last Mallard Creek tributary crosses NC 49 in the vicinity of the intersection of SR 1173. North of NC 49, the channel is eight to ten feet wide, with sand and clay substrate and a few logs, and steep banks three to five feet high. South (upstream) of NC 49, the channel is piped underground beneath the lawn of Plastics Manufacturing, Inc. The drainage basin area is less than one square mile.

In addition to the three Mallard Creek tributaries that cross NC 49, twenty other drainage crossings were located during field observation and/or review of previous project plans. All of the crossings are minor, i.e., less than 48 inch diameter pipes. Of the drainage crossings observed, wetland characteristics were only observed at the Mallard Creek tributaries, as discussed in more detail in Section 4.6.5.

Several farm ponds occur within 300 feet of the road, mostly on the north side. No major lakes or public drinking water supplies occur in the project area.

4.6.3.2 Water Quality

The North Carolina Division of Environmental Management (DEM) classifies all surface waters of the state according to their "existing or contemplated best usage." Mallard Creek, Back Creek and upper Rocky River are class C waters, intended for fish and wildlife habitat, agriculture and secondary (non-body contact) recreation.

Direct impacts of the project on surface water will be minimal because the project lies close to a watershed divide and crosses only three intermittent headwater streams. Secondary and cumulative impacts will accrue due to urban growth induced by this project. As the area of impervious surface increases, infiltration of rainwater is reduced, and stream velocities may increase. Increased peak storm flows, erosion and sedimentation may occur, and nutrient and pollutant removal capacities are reduced. Planning and zoning decisions by local governments would minimize long-term impacts.

Design measures to protect water quality from impacts of the project include avoiding public water supplies and high quality aquatic habitats, minimizing the number of stream crossing, minimizing segments where roads lie closely parallel to streams, and maximizing the distance from roads to streams to allow for stormwater infiltration and deposition of pollutants associated with road runoff. The current project design meets these criteria.

Construction practices to protect water quality include protection of stream bottom habitat from siltation by sedimentation control measures and retention of natural riparian vegetation. Mitigation for unavoidable impacts may include the restoration of stream bottom habitat taken by construction, and the replacement of riparian vegetation.

4.6.4 Floodplains

The 100-year floodplains located near the project as determined by the Federal Emergency Management Agency (FEMA) are shown on Figure 4.4. The proposed project will not impact any existing floodplains.

4.6.5 Wetlands

Four jurisdictional wetlands were located within a 100-foot corridor on either side of NC 49. Wetlands were identified and delineated in the field based on the procedures outlined in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. The locations of these wetlands are shown on Figure 4.5.

The first wetland is an oblong pit located on the south side of NC 49 approximately 1,200 feet west of the intersection with SR 2939. The wetland was formed when construction of the road isolated a headwater drainage from its outflow north of the road. The vegetation that characterizes this wetland consists of a dense tangle of shrubs and saplings, including sweetgum (Liquidambar styraciflua), red maple (Acer rubrum), black willow (Salix nigra), and willow oak (Quercus phellos), entwined with abundant vines dominated by blackberry (Rubus ssp.), Japanese honeysuckle (Lonicera japonica), and poison ivy (Toxicodendron radicans). The entire wetland site (.09 acres) was determined to lie within the proposed right of way and would be directly impacted by the project.

The second wetland site occurs from seepage associated with a headwater stream located more than 100 feet north of NC 49 at the intersection with SR 2939. The wetland is 10 to 15 feet wide and characterized by saturated soils and a dense pine-hardwood forest. The canopy includes loblolly pine (Pinus taeda), red maple, sweet gum, willow oak, and sycamore (Planatus occidentalis). Poison ivy and honeysuckle are abundant in the groundcover. The wetland follows the channel northwest, away from the project area, and would not be directly impacted by the proposed widening.

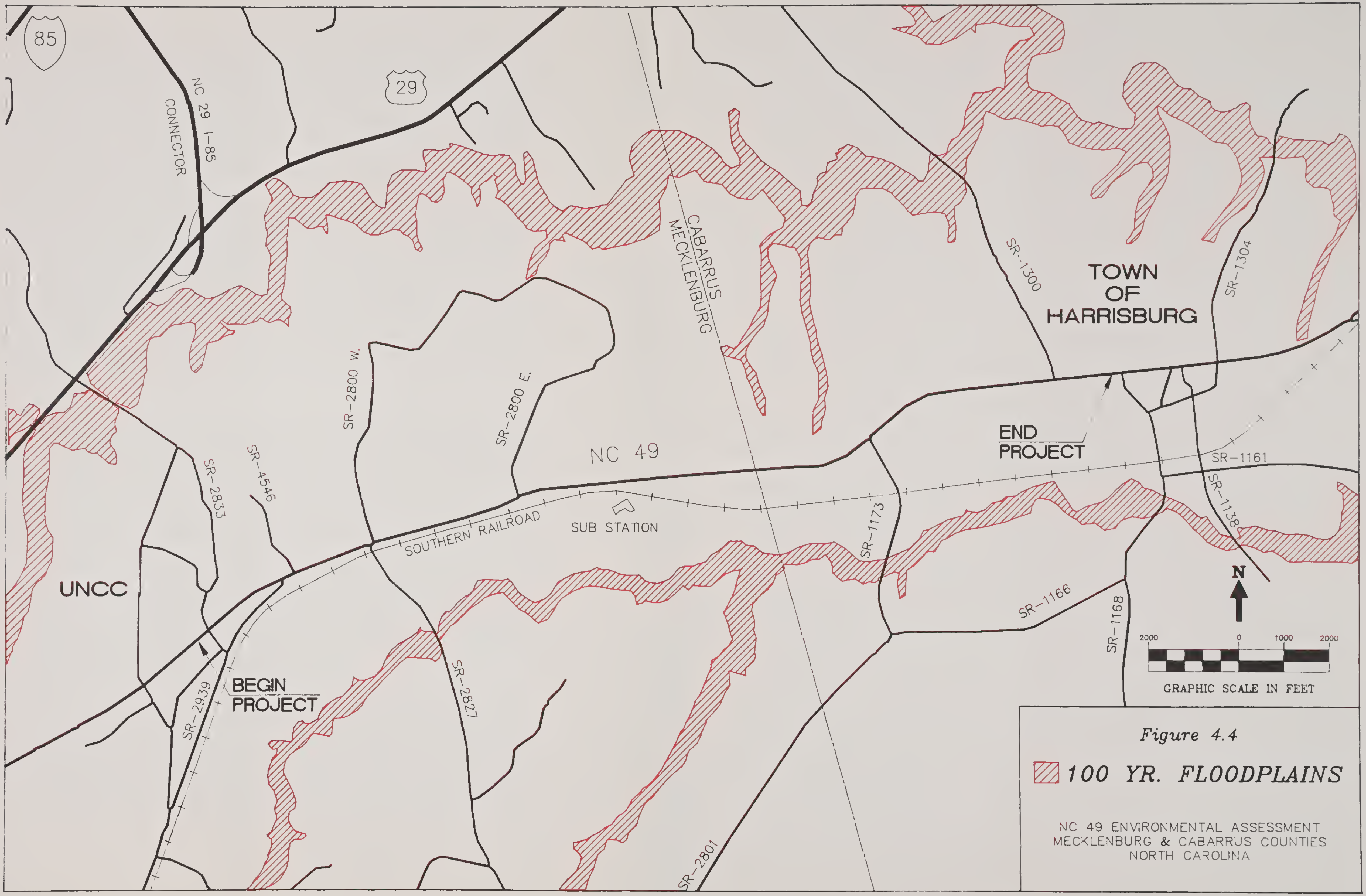

Figure 4.4

▨ *100 YR. FLOODPLAINS*

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The third wetland area consists of a marsh located adjacent to a 0.75-acre farm pond north of NC 49 and 2,000 feet west of the Mecklenburg/Cabarrus County line. The road is elevated 25 feet above the four-foot wide stream bed and floodplain. The pond lies about 170 feet north of the road, and the 100-foot wide marshy wetland extends from the base of the road shoulder to the pond. The wetland primarily receives runoff from drainage from NC 49 and a nearby livestock barn. The canopy vegetation is restricted to the wetland edges, with red maple, tulip poplar (Liriodendron tulipifera), American elm (Ulmus americana), sycamore, and green ash (Fraxinus pennsylvanica). The central area is vegetated with grasses (Pocceae), sedges (Carex ssp.), dock (Rumex ssp.), and buttercup (Ranunculcus ssp.). The mature bottomland forest south of NC 49 is non-wetland. Approximately 9,150 square feet (.21 acres) of this wetland site would be impacted by the project. The marsh constitutes the majority of wetlands impacted by the project.

The Wetland Evaluation Technique (WET 2.0) was used to assess the functional attributes of the pond and adjacent marsh. The results of the WET 2.0 evaluation are presented in Table 4.1. This evaluation indicated that the wetland has a high value as a nutrient and sediment filter upstream of the pond, Mallard Creek and downstream, and a high value in terms of social significance and effectiveness for sediment stabilization. The wetland is capable and effective for sediment/toxicant retention and nutrient removal/transportation. This wetland scored highly for uniqueness and heritage because the assessed area included most of the wetlands in the locality. However, due to contamination of fecal runoff from the barn, this wetland has little remaining natural habitat value.

The final wetland in the project area is associated with an intermittent tributary of Mallard Creek crossing NC 49 at Caldwell Road (SR 1173). This bank-to-bank wetland is 8 to 10 feet wide northwest of the intersection. The surrounding vegetation consists of a dense canopy of mixed upland and bottomland tree, inclu-

Table 4.1

Summary of WET 2.0 Evaluation

	Social Significance	Effectiveness	Opportunity
Ground Water Recharge	M	L	*
Ground Water Discharge	M	M	*
Floodflow Alteration	M	M	M
Sediment Stabilization	H	H	*
Sediment/Toxicant Retention	M	H	H
Nutrient/Removal/Transformation	M	H	H
Production Export	*	M	*
Wildlife Diversity/Abundance	M	*	*
Wildlife D/A Breeding	*	M	*
Wildlife D/A Migration	*	M	*
Wildlife D/A Wintering	*	M	*
Aquatic Diversity/Abundance	M	L	*
Uniqueness/Heritage	H	*	*
Recreation	L	*	*

H = HIGH
M = MODERATE
L = LOW
U = UNCERTAIN
* = FUNCTIONS AND VALUES NOT EVALUATED

ding sugarberry (*Celtis laevigata*), American elm, white oak (*Quercus alba*), and black cherry (*Prunus serotina*). The dense understory is composed of flowering dogwood (*Cornus florida*), grapevine (*Vitis* ssp.), Japanese honeysuckle (*Lonicera japonica*), and poison ivy. South of the road, the stream is piped underground beneath the lawn of Plastics Manufacturing, Inc. Less than .01 acre of this wetland would be impacted by the project.

Wetlands adjacent to the project area may receive short-term impacts associated with sedimentation during construction. Erosion from uplands and subsequent silt deposition in wetlands can be minimized using construction practices described in the section on water quality. Secondary and cumulative impacts to wetlands may include increased pollutants from road runoff and urban development, which may alter the biological composition and function of wetlands but would not affect wetland area.

In considering various alternatives, all attempts to avoid or minimize impacts to wetlands were pursued. The project would result in the unavoidable loss of approximately 0.3 acre of wetlands. The project is expected to qualify for a Nationwide permit under activity number 14 of Section 404 of the Clean Water Act of 1977.

4.6.6 Terrestrial Plant and Animal Habitats

The project area consists primarily of upland forest in young successional stages, fragmented by agricultural fields, rural residential areas, and commercial and industrial development. A few areas of mature forest occur near stream heads and on slopes too steep to farm. Five distinct types of biotic communities were identified in the study area. Descriptions of these communities are discussed in the following sections.

Urban And Residential Areas

The commercial fringe along the road has little or no vegetation and provides habitat for a few urban-adapted, non-native animals, such as the house sparrow (Passer domesticus), starling (Sturnus vulgaris), rock dove (Columba livia), house mouse (Mus musculus), and Norway rat (Rattus norvegicus).

Residential areas contain large expanses of cultivated grass, widely spaced native and ornamental trees, ornamental shrubs and bushes, buildings, abundant domestic predators, and introduced urban species of flora and fauna. Reptiles and amphibians of residential areas include a few small, secretive snakes (Virginia and Storeria species), ground skink (Scincella lateralis), American toad (Bufo americanus), and gray treefrog (Hyla chrysoscelis). Predominant birds include the urban species plus cardinal (Cardinalis cardinalis), robin (Turdus migratorius), chimney swift (Chaetura pelagica), white throated sparrow (Zonotrichia albicollis), and mockingbird (Mimus polyglottos). Typical mammals include gray squirrel (Sciurus carolinesis), raccoon (Procyon lotor), opposum (Didelphis virginia), and a species of bat (Chiroptera).

Old Fields

Abandoned agricultural fields and clearcut areas occur on both sides of the project corridor. Old fields are first colonized by various grasses (Poaceae) and annual wildflowers (especially Asteraceae), and within a few years became dominated by broomsedge (Andropogon sp.), blackberry (Rubus spp.), young loblolly and shortleaf pines (Pinus taeda and P. echinata), and sweetgum (Liquidambar styraciflua). Old field habitats support a distinct community of animals that exploit areas of early successional stage vegetation. Toads (Bufo americanus and B. woodhousei), frogs (Acris crepitans and Pseudacris triseriata), box turtle (Terrapene carolina), skinks (Eumeces spp.), six-lined racerunner (Cnemidophorus sexlineatus), and snakes (Elaphe, Coluber, Lampropeltis, and Thamnophis spp.) inhabit these transitional habitats. Old field birds include bobwhite (Colinus virginianus), meadowlark (Sturnella magna), killdeer (Charadrius vociferus), bluebird (Sialia sialis), mourning dove (Zenaida macroura), kestrel (Falco sparverius), and red-tailed hawk (Buteo jamaicense). Typical old field mammals include short-tailed shrew (Blarina carolinensis), woodchuck (Marmota monax), white-footed mouse (Peromyscus leucopus), cotton rat (Sigmodon hispidus), meadow vole (Microtus pennsylvanicus), eastern cottontail (Sylvilagus floridanus), and red fox (Vulpes vulpes). White tailed deer (Odocoileus virginiana) and bobcat (Felis rufus) frequent old fields bordered by forests. Old field habitats are abundant in the Piedmont.

Pine Forests

Loblolly and Virginia pine forests (Pinus taeda and P. Virginiana), occur along NC 49 where old fields or clearcut areas have been left to natural succession for 10 years or more. Some may be pine plantations. Pine forests in the project area are primarily less than 30 years old and are a few acres in size. Piedmont pine forests support a sparse community of animals because of low plant species diversity and the low nutritional value and decomposition rate of pine needles. Characteristic amphibians and reptiles are Fowlers toad (Bufo woodhousei), box turtle, and many of the same snake species as occur in old fields. Birds of pine forests include sharp-shinned hawk (Accipter striatus), brown-headed nuthatch (Sitta pusilla), kinglets (Regulus ssp.), pine warbler (Dendroica pinus), and several finches and sparrow (Fringillidae). Pine forest mammals include the opposum, raccoon, bat, gray squirrel, chipmunk (Tamias striatus), and other rodents. Pine forests are abundant in the Piedmont, recolonize old fields quickly, and grow more rapidly than hardwood forests.

Upland Hardwood Forests

Hardwood forests are of two major types: upland, often mixed with pine; and bottomland, generally without pines and often on hydric soils. Understory shrubs, vines, and herbaceous plant species are more diverse and numerous in hardwood forests than in pine forests. Hardwood forests offer more diversity of habitat and food resources, and support many more animal and plant species than do pine forests. Decaying leaf litter provides a food base for the insects and worms upon which many carnivores depend, and the living vegetation serves as food for many herbivores. Hardwood forests are slow growing and require half a century or more to achieve steady production of acorns, nuts, fruits, and seeds that support many forest animals, from small birds to deer.

The hardwood forest fragments in the project area are mostly young mesic to dry oak-hickory forests, dominated by white oak (Quercus alba), with northern red oak (Quercus rubra), post oak (Quercus stellata), mockernut hickory (Carya tomentosa), and pignut hickory(Carya glabra). Sourwood (Oxydendrum arboreum), red cedar (Juniperus virginiana), red maple (Acer rubrum), blackgum (Nyssa sylvatica), dogwood (Cornus florida), and highbush blueberry (Vaccinium corymbosum) characterize the understory. The reptiles and amphibians of upland hardwood forests include the old field and pine forest species, plus those requiring more moisture and shade, such as slimy salamander (Plethodon glutinosus) and tree frogs (Hyla supp.). Common birds of upland hardwood forests include most of the pine forest species, plus Great horned owl (Bubo virginianus), Swainson's thrush (Catharus ustulatus), red-eyed vireo (Vireo olivaceous), and summer tanager (Piranga rubra). Upland hardwood mammals include the pine forest species plus southern flying squirrel (Glaucomys volans), gray fox (Urocyon cinereoargenteus), and long-tailed weasel (Mustela frenata).

Bottomland Hardwood Forests

Small areas of Piedmont bottomland hardwood forests are associated with wetland areas defined in section 4.6.5. Bottomland hardwood forests occur in floodplain areas adjacent to streams, and are typically dominated by red maple (Acer rubrum), hornbeam (Carpinus caroliniana), sweet gum, tulip poplar (Liriodendron tulipifera), and green ash (Fraxinus pennsylvanica). If the soils remain wet for sufficient time (generally a week or longer during the growing season), they may become hydric, and wetland trees predominate, including river birch (Betula nigra), swamp black gum (Nyssa biflora), sycamore (Platanus occidentalis), alder

(Alnus serrulata), and black willow (Salix nigra).

Bottomland hardwood wetland forests have higher primary productivity than other habitats (Corps of Engineers, 1976), and support a rich diversity of plants and animals. Amphibian larvae requiring fish-free vernal pools, including spotted salamander (Ambystoma maculatum) and marbled salamander (Ambystoma opacum), occur in bottomlands. Many birds rely on bottomland hardwoods for nesting, foraging, and migration corridors, including nearly all of the wood warblers (Parulidae), red-shouldered hawk (Buteo lineatus), barred owl (Strix varia), and wood thrush (Hylocichal mustelina). Many game species such as wood duck (Aix sponsa), woodcock (Scolopax minor), and turkey (Meleagris gallapavo) depend on bottomlands. Typical mammals include most of the upland species plus gray fox, beaver (Castor canadensis), and mink (Mustela vison).

Many bottomland forests in the urbanized Piedmont Region have been destroyed by impoundments or conversion to agriculture and silviculture. The remaining stands are mostly along streams, where they serve as migration corridors and urban sanctuaries for many birds and mammals. Fragmentation of bottomland forests reduces their habitat value, especially for animals requiring large home ranges. Bottomland forests are extremely slow and difficult to re-establish. If the hydrology is altered, then they may never return. Bottomland forests not qualifying for wetland status receive no legal protection and are rapidly being lost in North Carolina.

The proposed project would reduce the size of the remaining fragments of forest along NC 49. Where impacts to forests are unavoidable, sale of marketable timber is recommended. Secondary and cumulative impacts will result in additional forest and old field loss due to urban growth promoted by the project.

4.6.7 Rare and Protected Species

The North Carolina Natural Heritage Program (NHP) documents and monitors populations of plant and animal species protected by Federal or state laws, and species not legally protected but recognized as rare by federal or state biologists. Table 4.2 presents a list of rare and protected species known from Mecklenburg and Cabarrus Counties. In April 1990, ecologists searched for evidence of the three protected species on the list: Nestronia (Nestronia umbellula), Small's portulaca (Portulaca smallii), and Schweinitz's sunflower (Helianthus schweinitzii). Nestronia, is currently identified as a candidate species for Federal status, and as a threatened species under state status. Small's portulaca is identified as an endangered species on the state's list of protected plant species. Schweinitz's sunflower is currently identified as an endangered species under both Federal and state listings.

Nestronia, a dioecious, colonial shrub 0.6 to 1.3 m tall, is parasitic on the roots of pines and oaks in mature upland forests, and flowers during April and May. The leaves are elliptic, opposite, and four to six cm long. Female flowers are borne singly in the leaf axils, whereas male flowers are in umbels of 3 to 11. Small areas of mature upland forest in the project corridor occur north of NC 49 just west of SR 1173, and north of NC 49 at the intersection of Old Concord Road. Nestronia could occur at these sites, but is typically found in larger stands of forest. The NHP has recorded a population of nestronia, in the Back Creek watershed within three miles of the project. Since evidence of the plant was not detected during the April survey, it is unlikely that the species will occur in the project corridor.

Small's portulaca, a succulent, creeping, diffusely branched annual, grows on granite outcrops and flowers from June to October. The plant is 3 to 10 cm tall with linear to narrowly spatulate leaves eight mm long and one mm wide. No granite outcrops were found; therefore, the species is unlikely to occur in the project corridor.

Schweinitz's sunflower, a fall-flowering perennial species, occurs in upland open woods, thickets, and pastures. A single or several pubescent stems 0.6 to 1.5 m tall arise from a basal crown with a tuberous root system. Lanceolate leaves 6 to

Table 4.2

Rare and Protected Species
of Cabarrus and Mecklenburg Counties

Scientific Name	Common Name	Federal Status	State Status
ANIMALS:			
Etheostoma collis	Carolina darter	-	C
Hybopsis zanema	Santee chub	-	C
PLANTS:			
Anemone berlandieri	Southern thimbleweed	-	C
Baptisia australis var. australis	Blue wild indigo	-	SR
Botrychium jenmanii	Alabama grape fern	-	SR
Cardamine dissecta	Dissected toothwort	-	SR
Carex projecta	Necklace sedge	-	SR
Cirsium carolinanum	Carolina thistle	-	SR
Dentaria multifida	Divided toothwort	-	SR
Echinacea pallida	Pale coneflower	-	SR
Echinacea purpurea	Purple coneflower	-	SR
Helianthus schweinitzii	Schweinitz's sunflower	E	E
Lotus purshianus var. Helleri	Heller's trefoil	-	SR
Nestronia umbellula	Nestronia	C	T
Panax quinquefolius	Ginseng	-	SC
Porteranthus stipulatus	Indian physic	-	SR
Portulaca smallii	Small's portulaca	-	E
Silphium terebinthinaceum	Prairie dock	-	C
Tortula propagulosa	Budding tortula	-	C

E = Endangered
T = Threatened
SC = Special Concern
SR = Significantly Rare
C = Candidate

E, T, and SC species are protected under Federal/State law.

18 cm long and one to two cm wide are opposite along the stem, except the uppermost ones which may be alternate. It has been recorded from Cabarrus and Mecklenburg Counties, but not from the project area. Old fields and upland forest edges in the project area could support this species, but it would not likely have been detected during the spring field reconnaissance. A search for the sunflower is best conducted during the fall, either in September or October.

Ginseng, a glabrous, perennial herb with a thick, fusiform root, occurs in rich, mesic, mature forests of the mountains and Piedmont, and flowers from May to June. Three or four palmately compound leaves, each with 3 or 5 elliptic to obovate, serrate leaflets are borne on a single stem 20 to 60 cm tall. Rich mesic woods, characterized by a canopy of beech (Fagus grandifolia), northern red oak, sugar maple (Acer saccharum), and tulip poplar, were not found in the project area. Therefore, ginseng is unlikely to occur in the project corridor. The state lists this species as special concern because it is commercially exploited.

The NHP has identified five rare, but currently unprotected, species near the project area in the vicinity of Back Creek Church. Four species have been recorded from within a half mile of the project. These species are prairie birdfoot-trefoil (Lotus purshianus), southern thimbleweed (Anemone berlandieri) necklace sedge (Carex projecta), and dissected toothwort (Cardamine dissecta). Blue wild indigo (Baptisia australis) occurs less than two miles from the eastern terminus of the project.

The project area does not contain known populations of protected species or significant natural areas and none were detected during the field survey conducted in April 1990. However, NCDOT will conduct a scientific survey for Schweinitz's sunflower in the project corridor to ensure that the species will not be affected prior to the expenditure of construction funds for this project.

4.6.8 Noise

A traffic noise analysis was performed to determine the highway-generated noise impacts of the proposed project. Traffic noise impacts were analyzed in accordance with the procedures established for the abatement of highway traffic noise and construction noise as outlined in Part 772 of Title 23 of The Code of Federal Regulations (CFR).

An effective, quantitative noise impact analysis includes the identification of existing noise-sensitive land uses in the study area and the measurement of ambient noise levels at these sites. Future (design year 2015) noise levels were predicted using the FHWA highway traffic noise prediction model STAMINA 2.0/OPTIMA program and then compared with both existing noise levels and design noise level guidelines to determine the noise impacts resulting from implementation of the project. The feasibility of alternative noise abatement measures for reducing or eliminating noise impacts were also addressed.

Noise sensitive receptors were selected based on noise abatement criteria established by FHWA for noise sensitive land uses (Table 4.3). In some cases, these receptors represented a group of receptors. Sites that were analyzed for potential noise impacts are described in Table 4.4 and are identified in Figure 4.6.

Existing noise levels were measured in March 1990 using a Metrosonics dB 306A METROLOGGER sound level meter. The meter integrates noise levels on a continuous basis and produces an equivalent (or average) sound level, Leq, for any desired test duration. Noise measurements were made during peak traffic periods and under meteorologically acceptable conditions. Traffic data was simultaneously recorded during the noise measurements and was classified into three vehicle types: automobile, medium truck, and heavy truck for later input into the STAMINA 2.0 noise prediction computer model.

TABLE 4.3

NOISE ABATEMENT CRITERIA (Hourly A-Weighted Sound Level - Decibels (dBA))			
Activity	Leq(h)	L10(h)	Description of Activity Category
A	57 (Exterior)	60 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	70 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 (Exterior)	75 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	--	Undeveloped lands.
E	52 (Interior)	55 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.
Source: Federal Highway Administration			

TABLE 4.4

NOISE RECEPTOR SITES

Site No.	Site Description
#1	The front facade of a condominium building located at the University Terrace Condominiums. Each building is three stories high and contains 12 apartment units. This site is representative of two other buildings in the complex. The closest building is located approximately 70 feet north of the existing edge of pavement. Activity category B was used to evaluate the noise impacts at site 1.
#2	The front facade of a newly constructed single family residence (model home) located on Hedgelawn Drive. This residence is representative of two other single-family residences in the same community. The residence is located approximately 200 feet north of the edge of pavement. Activity category B was used to evaluate the noise impacts at site 2.
#3	The front facade of an existing single-family residence located along Cedar Drive. This site is representative of seven other single-family homes. The residences are located approximately 260 feet north of the edge of pavement. Activity category B was used to evaluate the noise impacts at site 3.
#4	The Providence Baptist Church and the adjacent daycare playground area. The church is located approximately 560 feet south of the edge of pavement. Due to the presence of the daycare and playground, activity category B was used to evaluate the noise impacts at this site.
#5	The sidewalk in front of a single-family residence located at 208 NC 49 South. This residence is representative of five other single-family dwelling units. The residences are located approximately 150 feet north of the edge of pavement. Activity category B was used to evaluate the noise impacts at site 5.
#6	The sidewalk in front of the Harrisburg Presbyterian Church. The church is located approximately 65 feet to the south of the edge of pavement. Activity category E was used to evaluate the noise impacts at the church.

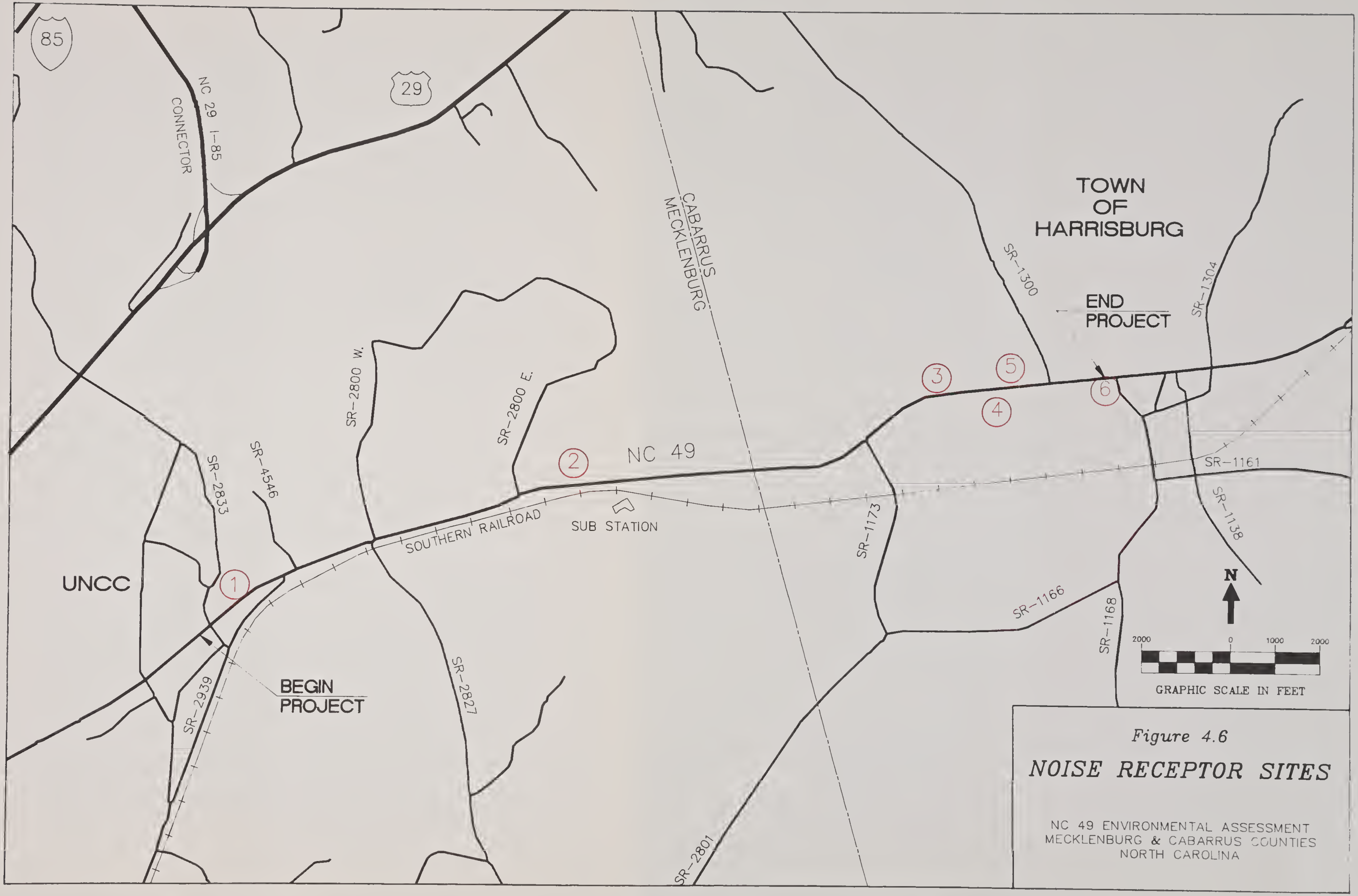

Figure 4.6

NOISE RECEPTOR SITES

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Existing noise levels are used to calibrate the STAMINA 2.0 model to existing conditions before using it to predict future noise levels. STAMINA 2.0 estimates vehicle noise emissions based on reference energy mean emission levels for three classes of vehicles: automobiles and light trucks, trucks with two axles and six wheels, and trucks with three or more axles. These are assumed to operate under cruise conditions on flat terrain. Adjustments are then applied to account for traffic volumes, speed, receptor distance from the roadway, grade, length of roadway segment, and shielding.

Ambient noise levels and modeled existing noise levels agreed within two decibels for the Leq descriptor at all of the selected noise sensitive sites. The slight differences between measured and modeled noise levels indicated that the STAMINA 2.0/OPTIMA model was reasonably calibrated to predict future noise levels.

Future Noise Levels

Future noise levels were modeled for three conditions:

- 2015 No-Build
- 2015 Build (4-lane facility without Outer Loop traffic)
- 2015 Build (8-lane facility with Outer Loop traffic)

Since the two Build conditions consist of widening the existing roadway and do not consider an entirely new alignment, the noise receptors selected for the existing conditions analysis were also used to predict of future noise levels. This provided a basis for comparing noise impacts for each of the alternatives. With the exception of site 6, the Harrisburg Presbyterian Church, noise-sensitive sites in the study area represent land use activities categorized in Activity Category B (Table 4.3 describes Activity Categories). The major activity determined to occur at site 6 was considered to be interior use, and FHWA Activity Category E criteria was used to evaluate the noise impacts of the church. Due to the type of structure (brick) and the presence of windows and air conditioning, an exterior/interior noise level reduction of 25 DBA was applied in the case of site 6.

The results of the noise analyses performed for each of the design year alternatives are described in the following sections and are summarized in Table 4.5.

No-Build

A preliminary analysis of the traffic noise impacts of the No-Build Alternative were evaluated assuming the current roadway configuration and 2015 design year traffic levels. Traffic levels for the design year were projected to increase dramatically over existing levels. The large increase in traffic can be attributed to both the overall rapid growth predicted for the area and the completion of Charlotte's Outer Loop.

Design year peak-hour traffic volumes on the existing two-lane facility would result in level of service "F" conditions and therefore, would not represent worst-case conditions. At level of service "F," vehicle operating speeds are severely reduced during peak hours due to traffic congestion, and result in lower noise levels being experienced than during off-peak conditions. To simulate the traffic condition that produces the highest noise levels, automobile traffic and design year truck traffic percentages that result in a level of service "C" condition were used. Based on procedures outlined in the *FHWA Highway Traffic Noise Prediction Model* (Report No. FHWA-RD-77-108), level of service "C" volumes are more likely to produce the highest noise levels.

The results of the noise analysis conducted for the No-Build Alternative indicate that noise levels would increase 4 decibels over existing levels for sites 1, 3, 5 and 6. At site 2, predicted noise levels would increase 2 decibels over existing noise levels. Noise levels at site 4 are not predicted to increase over existing levels.

TABLE 4.5

SUMMARY OF NOISE LEVELS (dBA)

		EXISTING		FUTURE NOISE LEVELS			
Site No.	Receptor	Measured	Modeled	No-Build	2015 (with Outer Loop)	2015 (w/o Outer Loop)	Noise Abatement Criteria
1	University Terrace Condominiums	65	66	69	74	72	67
2	Leslie Farms Subdivision	63	64	65	66	65	67
3	Cedar St. (Residence)	59	60	63	61	60	67
4	Providence Baptist Church	60	59	60	60	59	67
5	208 NC49 South (Residence)	62	62	66	65	64	67
6	Harrisburg Presbyterian Church	42	42	46	45	44	52*

* -- based on FHWA activity category E.

2015 Build (4-Lane Facility Without Outer Loop)

The noise impacts of a four-lane facility for the design year (2015) without the additional traffic generated by the Outer Loop project were assessed. The impacts of a five-lane urban section were addressed for those receptors located in Harrisburg (Sites 3-6).

Even without the traffic generated by the Outer Loop project, NC 49 would operate at level of service "E" or worse during peak traffic conditions by the year 2015. For this reason, this analysis assumed automobile traffic and design hour truck traffic that would yield an overall level of service "C" for either a four-lane divided or five-lane urban section.

Predicted noise levels for this alternative would either decrease or remain the same at all but one receptor when compared to noise levels predicted for the No-Build Alternative. Noise levels at site 1 would increase 3 dBA over noise levels without the proposed project. The resultant noise level of 72 dBA at site 1 would exceed noise abatement criteria. When compared to existing noise levels, noise level increases ranged from 1 dBA at site 3 to 7 dBA at site 1.

2015 Build (8-Lane Facility With Outer Loop)

Under this alternative, noise impacts were predicted assuming an eight-lane divided facility for receptors 1 and 2, and a five-lane urban section in Harrisburg for receptors 3 through 6. Based on capacity analyses performed using the Highway Capacity Software (HCS), year 2015 peak hour traffic with the Outer Loop project would operate at an acceptable level of service (LOS "C") assuming a eight-lane divided section. Therefore, year 2015 peak hour traffic volumes were used in the analysis of noise impacts for receptors 1 and 2. Since the ultimate design configuration of NC 49 through Harrisburg is a five-lane urban section, automobile traffic and design year truck traffic that would yield a level of service "C" condition was used for assessing the noise impacts of sites 3 through 6.

Noise levels at sites 1 and 2 would reach their highest level for this alternative. Predicted noise levels at site 1 would increase 9 dBA over existing levels and 5 dBA over noise levels predicted for the No-Build Alternative. At site 2, noise levels increase 3 dBA over existing levels and 1 dBA over noise levels without the project. Noise levels for sites 3 through 6 would be lower than noise levels under the No-Build Alternative and represent only slight noise increases (2-3 DBA) over existing levels.

Mitigation Measures

The North Carolina Department of Transportation in conjunction with FHWA has developed guidelines to determine the need, feasibility, and reasonableness of noise abatement measures for all major highway projects. In summary, noise abatement must be considered if either of the following conditions exist:

1) The predicted design year noise levels approach or exceed noise abatement criteria established for various land use activities as shown in Table 4.3. Noise levels were considered to approach noise abatement criteria if the resultant value is 1 DBA less than the value shown for the appropriate category.

2) The predicted design year noise levels substantially exceed existing noise levels. For those receptors whose ambient or existing noise levels (Leq) are less than or equal to 50 DBA, substantial is defined as greater than or equal to a 15 decibel increase. For sites whose ambient levels are greater than 50 dBA, substantial is defined as greater than or equal to a 10 decibel increase.

Under these guidelines, noise abatement must be considered for receptors 1 and 2. Noise levels at site 1 are predicted to exceed the noise abatement criteria of 67 dBA. Noise levels at site 2 would approach the respected criteria.

The opportunities for abating traffic noise, however, are limited. The primary means of mitigating noise impacts are listed as follows:

- Traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, modified speed limits, and exclusive lane designations),
- Alteration of horizontal and vertical alignments,
- Acquisition of property rights (either in fee or lesser interest) for construction of noise barriers,
- Construction of noise barriers (including landscaping for esthetics purposes) whether within or outside the highway right of way.
- Acquisition of real property or interests therein (predominately unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. This measure may be included in Type I* projects only.

* The following definition of Type 1 project is defined in 23 CFR Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise:

A proposed Federal or Federal-aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes.

A preliminary evaluation as to the reasonableness of various noise abatement measures was conducted with respect to the affected receptors.

Traffic Management Measures: Traffic management measures were not considered feasible for abating noise impacts for any receptor. Measures such as installation of additional traffic control devices, prohibition of vehicle types, time-use restrictions, speed limit reductions and exclusive lane designations would be adversely detrimental to NC 49's ability to function as a principal arterial and major thoroughfare route. In addition, restricting truck traffic would be very difficult to enforce and was considered to be a disincentive to economic development.

Alteration Of Horizontal And Vertical Alignments: The selection of a preferred alignment includes shifting the alignment both vertically and horizontally, wherever feasible, to minimize impacts to adjacent land uses. While the majority of the widening of NC 49 is planned to occur to the north, the project alignment was shifted horizontally to the south at the beginning to minimize impacts to the University Terrace Condominiums (site 1).

Acquisition Of Property Rights For Construction Of Noise Barriers: The need for noise abatement methods, whether by constructing noise barriers or by alternative means, has been identified for this project. If cost-feasible, the NCDOT shall consider property acquisition for barriers during final design.

Construction Of Noise Barriers Within Or Outside The Highway Right Of Way: Consideration of constructing noise barriers was investigated for those sites previously identified as meeting the criteria for mitigation. Noise barriers to abate traffic noise impacts were considered at sites 1 and 2. A detailed barrier analysis was conducted for sites 1 and 2 where noise levels approach or exceed the FHWA noise abatement criteria and a discussion of the analysis is presented in a subsequent section.

Acquisition Of Real Property For Buffer Zones: A most effective method for noise abatement is the use of land use controls to limit noise sensitive land uses to be located adjacent to the proposed project. However, these measures are more effective in undeveloped areas, and would have little effect on existing sites. It is recommended that policies for establishing proper setback distances be developed based on identified noise contours in these areas.

The 67 dBA Leq noise contour was estimated for undeveloped areas located adjacent to the proposed project. Because of changes in traffic volumes and different facility types, NC 49 was divided into two segments for modeling purposes. These segments were identified as:

- Segment A-- 8-lane section from Mallard Creek Church Road (SR 2833) to approximately 400 feet west of Caldwell Road (SR 1173).

- Segment B-- 5-lane urban section from Caldwell Road to end of project in Harrisburg.

For Segment A, the distance from the 67 dBA contour to the nearest travel lane, was estimated at 150 feet. The distance to the 67 dBA contour for Segment B is approximately 90 feet.

Barrier Analysis

The computer barrier design program OPTIMA was used to evaluate highway noise barriers. The program permits the user to examine the effectiveness and cost of several different design configurations and very quickly select the most cost-effective barrier design.

The initial geometry of the barrier (location, height and width) are first entered into the STAMINA 2.0 program. Based on this preliminary input data, the program generates an acoustical file for input into OPTIMA. In addition to the acoustics file, the OPTIMA program requires additional input to perform the cost/effectiveness analysis. This information includes the type of barrier material desired, the number of people represented per receptor and the design noise level required for each receptor.

The OPTIMA program then calculates an effectiveness-to-cost ratio for each barrier section at any specified height. The effectiveness of a barrier is defined in terms of the relationship between the amount of reduction in noise level provided by the barrier and the number of people affected. Cost is defined as the total construction cost of the barrier design configuration. The total costs were adjusted to reflect 1990 dollars.

Although there are very few limitations in the programs as to the nature of the barrier design being evaluated, the NCDOT with assistance from FHWA has developed guidelines to be used in the analysis of noise abatement measures. In determining the reasonableness for the location of a potential noise barrier, the following concerns were addressed:

- The abatement measure must be cost effective. Cost effectiveness is defined at $25,000 per effectively protected (4 dBA or more reduction) residence.
- The exposed height of wall does not exceed a maximum of 25 feet.
- It will not be reasonable to provide abatement unless the receptor is located a distance of four times the height of wall or more from the proposed wall.
- The change in noise levels between design year traffic levels and existing noise levels must exceed 3 dBA (a barely perceptible change).
- There is documented support of the benefitted residents (4 dBA or more reduction) for placement of abatement measures.

- Unless special conditions exist, it is not considered reasonable to provide noise abatement for impacted businesses or isolated receptors. Businesses generally prefer visibility from the transportation facility. Based on past project experience, it is considered unreasonable to provide abatement for isolated residences, due to the cost of abatement versus the benefits provided.

- Unless special conditions exist and effective abatement can be provided, it is not considered reasonable to provide noise abatement on non-controlled or partial access controlled facilities.

- The noise barrier will be located beyond the clear recovery zone or be incorporated into safety devices.

- Unless special conditions exist, it is not considered reasonable to construct walls on the shoulder because of safety, drainage problems, trash accumulation, etc.

- In areas of impacted receptors where abatement measures have been considered, a vegetative barrier may be considered for aesthetic screening even though an acoustical barrier is not justified.

With respect to these and other guidelines, a noise barrier analysis was conducted for sites 1 and 2. The results of the analysis conducted for site 1 indicate that a concrete barrier along the north side of NC 49 would reduce predicted design noise levels at building #1 from 74 dBA to 66 dBA. Building #3, which was constructed at a higher elevation than buildings #1 and #2, would have future noise levels reduced from 72 dBA to 66 dBA. To achieve these reductions, a noise wall 10 feet in height and approximately 535 feet in length would be required. The cost for constructing a noise barrier of these dimensions was estimated at $90,400 (1990 dollars). The three buildings would receive a minimum of a 4 dBA reduction, and are therefore effectively protected. The buildings represent a total of 12 first-floor condominium units that would be benefitted. The cost of constructing the wall, $90,400, divided by the 12 residential units yields a cost/benefit ratio of approximately $7,500.

At site 2, year 2015 predicted noise levels approach the noise abatement criteria of 67 dBA. To mitigate these levels, the impacts of constructing a concrete noise wall along the north side of NC 49 were evaluated. In addition to the single residence previously analyzed, noise levels with a barrier were predicted for an additional residence. This residence was constructed after ambient noise readings were taken for the study area and is located closer to the highway right of way. Although an earthen berm exists between this residence and NC 49 to shield the house from highway and railroad noise, the berm is located within the proposed right of way and was not modeled.

Results of the barrier analysis conducted for site 2 indicate that a noise wall in excess of 25 feet in height and approximately 480 feet in length would be required to achieve a minimum insertion loss of 6 dBA. Therefore the feasibility of constructing a noise wall at this site would not be cost effective.

In summary, traffic noise impacts would occur as a result of the proposed widening of NC 49. Based on noise analyses conducted for this study, FHWA noise abatement criteria would be approached or exceeded at two of the six noise-sensitive sites selected. These sites include the University Terrace Condominiums and residences located in the Leslie Farms Subdivision.

Noise abatement measures, in concert with FHWA and NCDOT Policies and Guidelines were then addressed for these sites. The following measures and/or combination of measures are likely to be effective towards reducing future noise levels. These measures are identified as follows:

- Construct noise barriers along NC 49 to shield residents in University Terrace Condominiums. The cost for constructing an effective barrier at this location was estimated at $90,400. The cost to benefitted receptor ratio is approximately $7,500.

- Institute land use controls (buffer zones) to limit noise sensitive land uses too close to the proposed project. Again, these measures would only be effective in the few undeveloped areas along the route and in areas that may undergo zoning changes.

Final determination as to the need, feasibility, and reasonableness of constructing noise barriers as a means for abating noise impacts of the proposed project will be performed during the final roadway design.

4.6.9 Air Quality

A microscale air quality analysis was conducted to determine if carbon monoxide (CO) emissions associated with the project would cause or contribute to exceedances of the National Ambient Air Quality Standards (NAAQS). EPA established NAAQS under the authority of the Clean Air Act of 1970 and are presented in Table 4.6. Since CO is a product of combustion, relatively inert, and emitted near the ground, the highest concentrations are typically found in the vicinity of the source. Rather than conduct an areawide pollution burden analysis, CO concentrations were evaluated at locations where humans are in close proximity to the roadway.

The analysis was conducted in accordance with NCDOT and North Carolina Department of Environment, Health, and Natural Resources (NCDEHNR), guidelines and recommendations for evaluating the air quality impacts of roadway

TABLE 4.6

AMBIENT AIR QUALITY STANDARDS

POLLUTANT	TIME OF AVG.	PRIMARY STANDARD	SECONDARY STANDARD	NORTH CAROLINA STANDARD
TSP	Ann. Geo. Mean	75 ug/m^3	None	75 ug/m^3
	24-Hour	260 ug/m^3	150 ug/m	150 ug/m^3
SO$_2$	Ann. Arith. Mean	80 ug/m^3	None	80 ug/m^3
	24-Hour	375 ug/m^3	None	365 ug/m^3
	3-Hour	None	1,300 ug/m^3	1,300 ug/m^3
NO$_2$	Ann. Arith. Mean	100 ug/m^3	Same as primary	100 ug/m^3
CO	8-Hour	10 mg/m^3 (9 ppm)	None	10 mg/m^3 (9 ppm)
	1-Hour	40 mg/m^3 (35 ppm)	None	40 mg/m^3 (35 ppm)
O$_3$	1-Hour	0.12 ppm	Same as primary	0.125 ppm
Pb	Quarterly Arith. Mean	1.5 ug/m^3	Same as primary	1.5 ug/m^3

Note: All standards with averaging times of 24 hours or less are not to be exceeded more than once per year.

ug/m^3 - micrograms per cubic meter of air.
mg/m^3 - milligrams per cubic meter of air.
ppm - parts per million.

Source: State of North Carolina, Department of Environment, Health, and Natural Resources, Division of Environmental Management (NCDEHNR).

facilities. The analysis was conducted for both existing and future conditions with and without the proposed project.

The dispersion of CO in the study area was simulated using CALINE4, a computerized dispersion model developed by the California Department of Transportation. Data inputs to the CALINE4 program include motor vehicle emission factors, worst-case meteorological conditions, and receptor and roadway site geometry. Emission factors were generated by MOBILE4, a computer model that calculates emission factors for hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NO_x) from gasoline and diesel fueled motor vehicles. Emission factors are calculated based on various operating conditions such as ambient temperature, vehicle mix, vehicle speed, mileage accrual rates, percent cold and hot starts, and inspection/maintenance parameters.

The analysis was conducted under simulated meteorological conditions that would yield the most probable worst-case CO concentrations. These conditions include a low wind speed (1 m/sec), moderately stable atmosphere (Class E) and low ambient temperature. CALINE4 also has the capability for the user to select the model to conduct a worst-case wind angle search based on the location of the receptor and its relationship to the roadway.

The location of sensitive receptors, which represent sites where humans would be exposed to CO concentrations directly resulting from the project, are shown in Figure 4.7. These receptors were also used in the noise analysis and are described in Table 4.4. The program automatically totals the contributions from each link or segment for each receptor. Generally, the roadway segment immediately adjacent to a receptor represents the heaviest roadway contribution to that receptor.

The modeling procedure described above using CALINE4 was used to predict hourly "worst-case" CO concentrations. In order to compare with the NAAQS, these hourly concentrations must be converted into eight-hour concentrations. A

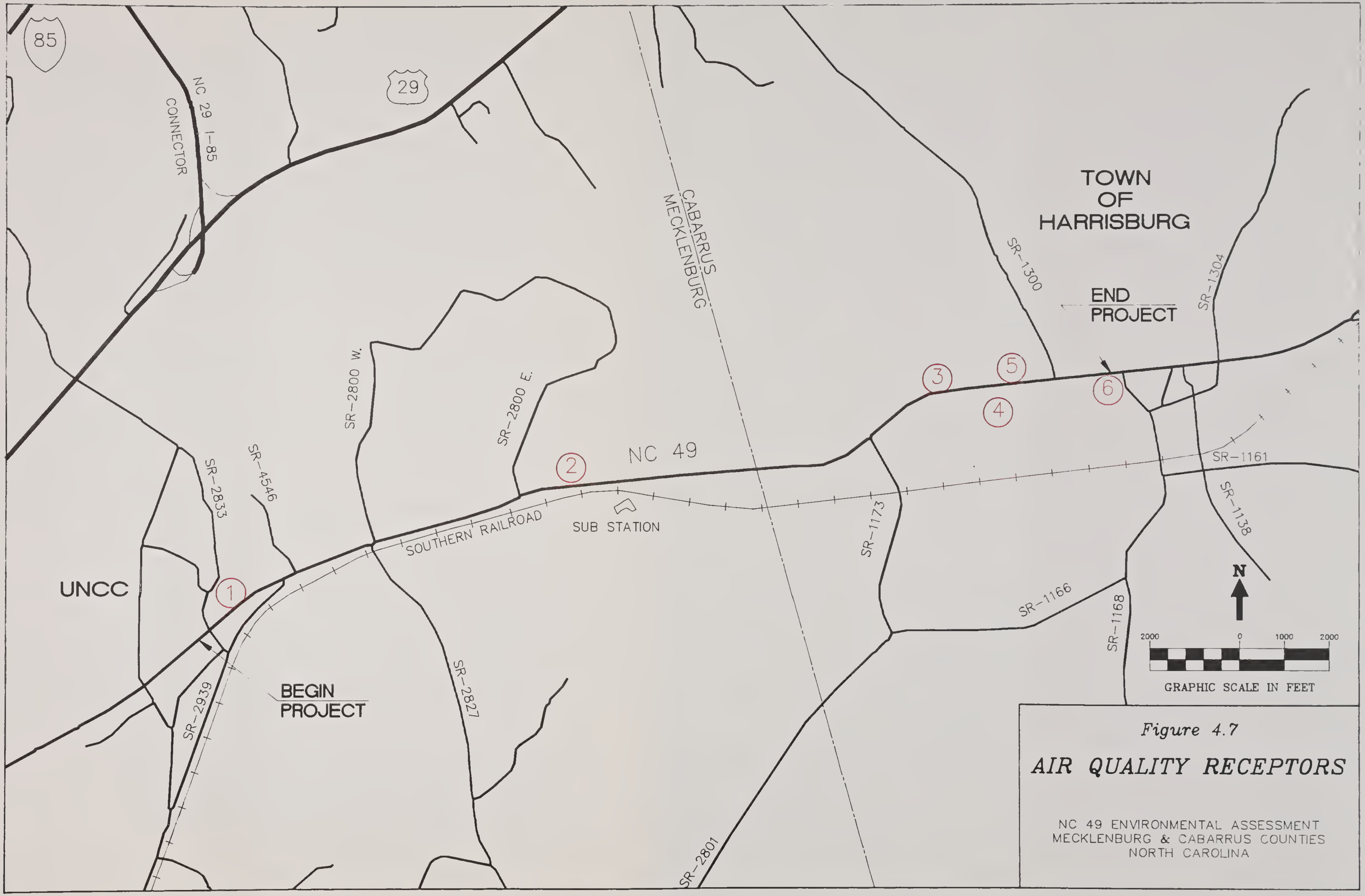

Figure 4.7

AIR QUALITY RECEPTORS

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persistence factor of 0.61 was used to account for the variation in traffic and meteorological conditions over an eight-hour period. Information on the persistence factor was provided by NCDEHNR.

In addition to the concentration of CO directly emitted by vehicles on the roadway, ambient CO concentrations generated outside the immediate vicinity of the roadway may also exist. These ambient concentrations are referred to as background concentrations and are defined as the concentration of a pollutant at a point upwind of the source. Based on information provided by NCDEHNR, background concentrations of 1.9 ppm and 1.2 ppm were assumed for the one-hour and eight-hour analyses, respectively.

The results of the air quality analysis conducted for each alternative are presented in Table 4.7. It is evident that with or without construction of the project no exceedances of the one-hour or eight-hour standards would occur. A brief description of the results of each scenario are outlined in the following sections.

4.6.9.1 Existing Air Quality

The results of the air quality analysis performed for existing conditions (1990) indicate that the highest one-hour and eight-hour concentrations occur at site 6 (Harrisburg Presbyterian Church) with concentrations of 3.8 ppm and 2.3 ppm, respectively. Site 6 is the receptor closest to the proposed project and was generally determined to have the highest concentrations. The major source of CO levels at the church can be attributed to vehicles either idling or slowing down at the intersection of NC 49 and Robinson Church Road (SR 1166).

Carbon monoxide is currently being monitored in Mecklenburg County at Plaza Road and Lakedell Drive. The monitor is located approximately four miles from the study area. Monitoring data

TABLE 4.7

SUMMARY OF CARBON MONOXIDE (CO) CONCENTRATIONS
(parts per million)

				2005 CO LEVELS						2015 CO LEVELS					
Site No.	Receptor	1990		NO-BUILD		BUILD (6 Lanes)		BUILD (8 Lanes)		NO-BUILD		BUILD (4 Lanes)*		BUILD (8 Lanes)	
		One Hour	Eight Hour	One Hour	Eight Hour	One Hour	Eight Hour	One Hour	Eight Hour	One Hour	Eight Hour	One Hour	Eight Hour	One Hour	Eight Hour
1	University Terrace Condominiums	2.6	1.6	2.8	1.7	2.5	1.6	2.5	1.6	3.4	2.1	2.8	1.7	2.9	1.8
2	Leslie Farms Subdivision	2.1	1.3	2.3	1.4	2.2	1.4	2.2	1.4	2.5	1.6	2.4	1.5	2.5	1.6
3	Cedar St. (Residence)	2.2	1.4	2.3	1.4	2.3	1.4	2.3	1.4	2.6	1.7	2.6	1.6	2.8	1.7
4	Providence Baptist Church	2.1	1.3	2.1	1.3	2.2	1.4	2.2	1.4	2.3	1.4	2.3	1.4	2.4	1.5
5	208 NC 49 South (Residence)	2.5	1.6	2.5	1.6	2.6	1.7	2.6	1.7	2.9	1.8	2.9	1.8	3.1	1.9
6	Harrisburg Presbyterian Church	3.8	2.3	3.7	2.3	3.7	2.3	3.7	2.3	4.7	3.0	4.2	2.6	4.8	3.0

* WITHOUT OUTER LOOP TRAFFIC

NOTE: The one-hour standard for CO is 35 ppm and the eight-hour standard is 9 ppm. Concentrations assume background contributions of 1.9 ppm for the one-hour analysis and 1.2 ppm for the eight-hour analysis.

from 1988 through August 1990 indicate that no violations of either the one-hour or eight-hour standard were recorded.

4.6.9.2 Future CO Analysis

An analysis of future CO concentrations was conducted for both year 2005 and 2015 (design year) conditions. For comparative purposes, CO concentrations were modeled for three scenarios under each analysis year. Each scenario was analyzed assuming the peak-hour traffic volumes and worst-case meteorological conditions described previously. Based on the type of roadway facility being evaluated, the Highway Capacity Software (HCS) was used to determine operating speeds for input into the MOBILE4 program. Composite emission factors were then generated for each scenario. These scenarios were defined as follows:

2005
- No-Build
- Build (6-lane divided)
- Build (8-lane divided)

2015
- No-Build
- Build (4-lane divided without Outer Loop)
- Build (8-lane divided)

The results of the air quality analyses performed for the year 2005 conditions indicate that overall the No-Build Alternative would result in the highest one-hour and eight-hour concentrations. Although all three alternatives have approximately the same CO levels experienced for receptor sites 3 through 6, the No-Build

Alternative would result in slightly higher one-hour CO levels at sites 1 and 2.

Without improvements to NC 49, traffic flow will become severely congested resulting in slower operating speeds, increased vehicle delay and idling, and higher CO emission rates. As expected, one-hour concentrations at sites 1 and 2 for the eight-lane Build Alternative were slightly lower than either the No-Build or six-lane Build Alternatives.

A comparison of CO concentrations predicted for the 2015 (design year) Alternatives reveals that with the exception of concentrations predicted for site 1, the eight-lane Build Alternative with projected Outer Loop traffic would result in the highest concentrations. One-hour concentrations ranged from 2.4 ppm to 4.8 ppm while eight-hour concentrations ranged from 1.5 ppm to 3.0 ppm for the eight-lane Build Alternative. Predicted concentrations for the four-lane Build Alternative without Outer Loop traffic ranged from 2.3 ppm to 4.2 ppm and from 1.4 ppm to 2.6 ppm for the one-hour and eight-hour analyses, respectively.

The results of the CO analysis based on CALINE4 modeling indicate that under no circumstances would concentrations generated by any of the alternatives approach or exceed the one-hour standard of 35 ppm or the eight-hour standard of 9 ppm. CO concentrations were, however, determined to reach their highest levels with the proposed project for the design year.

The proposed project is located within the Metropolitan-Charlotte Interstate Air Quality Control Region. The project is in an air quality non-attainment area which has transportation control measures in the State Implementation Plan (SIP). The SIP was approved by the EPA. The FHWA has determined that both the Transportation Plan and the Transportation Improvement Program (TIP) conform to the SIP. The FHWA has determined that this project is included in the TIP for the Charlotte-Metropolitan Planning Area. Therefore, pursuant to 23 CFR 770, this project conforms to the SIP.

4.6.10 Hazardous Waste

The primary concern for hazardous waste and the improvement of an existing roadway facility is the potential to disrupt or disturb existing waste sites. It is essential to identify early in the development of a project, the locations or potential locations of hazardous waste sites. Discovery of a hazardous waste site during right of way acquisition or construction would have a detrimental impact on the project. The project could be delayed or even halted until a lengthy, detailed and expensive evaluation of the site is completed. If identified early in the process, mitigative measures to either eliminate or minimize the impacts of hazardous waste sites can be addressed.

A hazardous waste survey was conducted for the NC 49 project area on April 19, 1990, from just west of SR 2833 to SR 1168 in Harrisburg. Known or potential hazardous waste sites located in the project area are shown on Figure 4.8 and are described in the following sections. In order to identify or verify potential hazardous waste sites the following information was used:

- Aerial photography, both past and present, of the study area;
- Field investigation and evaluation of existing land uses;
- Records and reports from state and local agencies regarding the use and disposal of hazardous wastes;

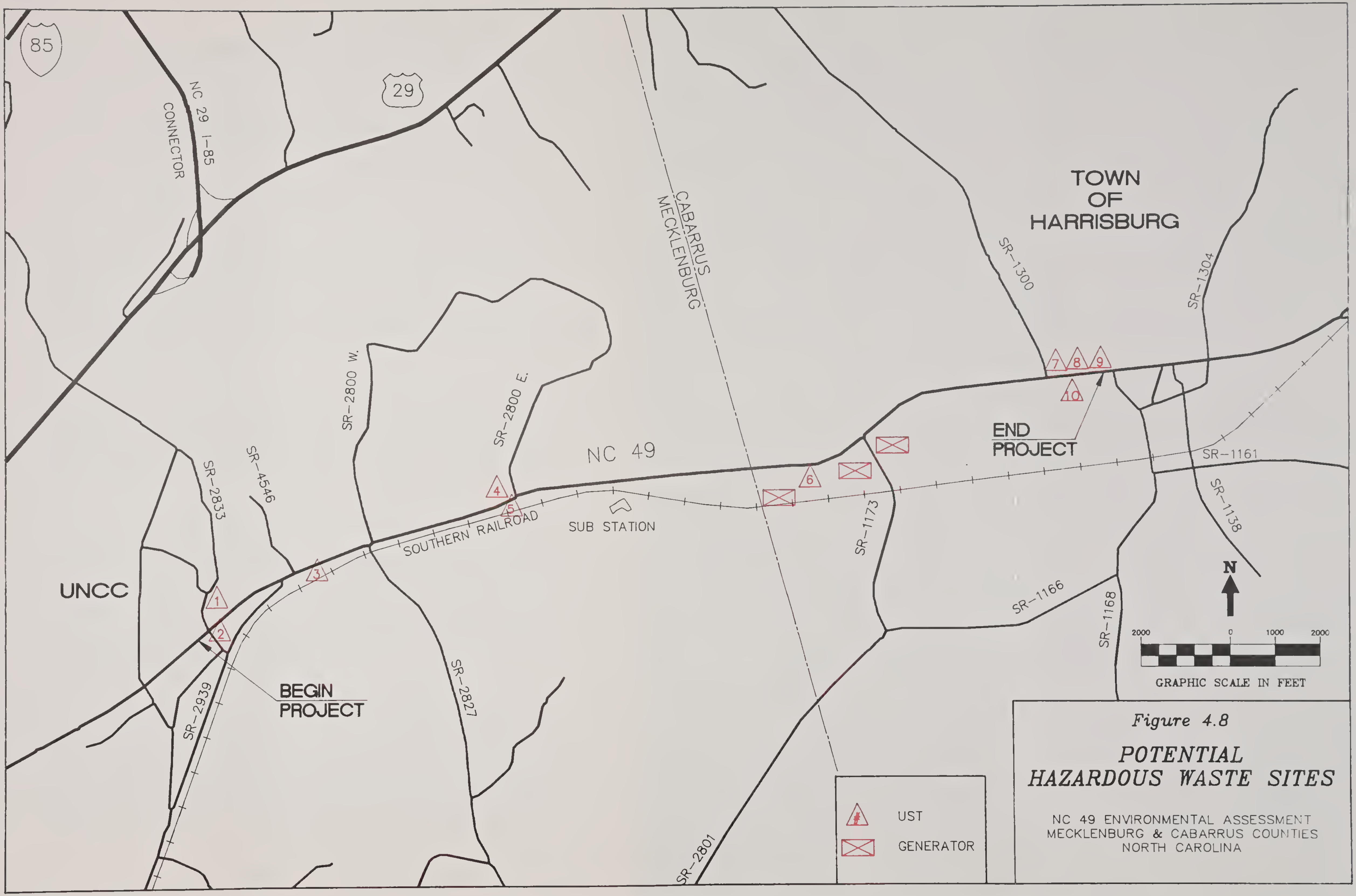

Figure 4.8

POTENTIAL HAZARDOUS WASTE SITES

NC 49 ENVIRONMENTAL ASSESSMENT
MECKLENBURG & CABARRUS COUNTIES
NORTH CAROLINA

- Federal government documents such as the national priorities list (NPS);
- Contact with representatives of agencies responsible for the control, regulation, and maintenance of hazardous wastes;
- Interviews with current landowners.

The manufacture, use, storage, treatment, transportation, and disposal of hazardous wastes is regulated by the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the hazardous and solid waste amendments (HSWA) of 1984. Data on RCRA sites is maintained in North Carolina by the DEHNR Solid and Hazardous Waste Sections.

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, is responsible for regulating the control, cleanup, and liability designation for abandoned, uncontrolled, or inactive waste sites. The CERCLA is also designed to handle hazardous waste discharges and emergencies.

The 1986 Amendments to CERCLA, also known as Superfund Amendments and Reauthorization Act of 1986 (SARA), were designed to provide protection against liability for both private and public "Innocent Landowners." This defense was provided for those parties who acquire property without knowledge of the presence of a hazardous waste and who made a good faith effort to identify any hazardous wastes located at the site prior to purchase.

There are other Federal laws that have relevance to the generation, control, disposal, or detection of hazardous wastes. These include the Clean Water Act, Safe Drinking Water Act, The Toxic Substances Control Act, The Clean Air Act, The National Environmental Protection Act (NEPA) and The Occupational Safety and Health Act (OSHA).

The results of the research conducted in reviewing NCDEHNR's inventories of hazardous wastes sites are summarized below:

- RCRA hazardous waste facilities
    - Fenestra
    - Plastics Manufacturing, Inc.
    - Galvan Industries

- RCRA hazardous waste transporter, storer and disposal (TSD) facilities
    - Mineral Research and Development Corporation
- Superfund sites
    - Galvan Industries
    - Mineral Research and Development Corporation

Currently there are no sites in the project area listed either on the NCDEHNR's list of sites with investigations pending or list of superfund cleanup actions. In addition, there are no active permitted solid waste landfills located in the area.

There have been four chemical spills reported within a one-mile radius of NC 49 by NCDEHNR since 1982. Two of the spills were located in Mecklenburg County. Fuel spills are not covered by RCRA or CERCLA, but are reported to the NCDEHNR Groundwater Section in North Carolina under the State Oil and Hazardous Substances Pollution Control Act.

The results of the hazardous waste field investigation conducted along NC 49 revealed there are three generators of hazardous waste in the project area. These are Fenestra, Plastics Manufacturing, and Galvan Industries. Fenestra, which is located southwest of the intersection of Caldwell Road (SR 1173) and NC 49, has received one notice of violation for noncompliance of rules and regulations from EPA and was not in compliance as of June 1990. Plastics Manufacturing is located southeast of the intersection of NC 49 and Caldwell Road (SR 1173) while Galvan Industries is located between NC 49 and the Southern Railroad, just east of the Mecklenburg/Cabarrus County line. Both Galvan Industries and Plastics Manufacturing are in compliance with all rules and regulations.

Based on the field survey conducted in April 1990, a number of existing, modified, or former service stations were found to occur along the project route. Service stations that store and dispense gasoline are generally not considered significant hazardous waste sites. However, both underground storage tanks (UST) and above-ground tanks used for the storage of petroleum products are regulated as hazardous materials sites.

A total of ten sites in the project area were identified as having involvement with underground storage tanks (Figure 4.8). Of these sites, six are existing service stations currently in operation and four are former service stations. Two of the former gas stations, the Cameo Pool and Patio business (UST-9) and Ritchie Auto Parts (UST-10), have reportedly had tanks removed within the past five years. A recent field survey conducted on May 3, 1991 indicated that tanks had been recently removed at two former gas stations: the former 49er's Mart (UST-4) located on the north side of NC 49 at east Harris Houston Road (SR 2800) and the former Harrisburg Auto Service (UST-8). Both sites exhibited signs of recent excavation and soil remediation. In addition to acquiring additional right of way from a number of businesses along NC 49, the project will require the removal of the Union 76 service station and tanks (UST-6) located south of NC 49, just east of the Mecklenburg/Cabarrus County line and the former 49er's Mart.

4.6.11 Construction Impacts

4.6.11.1 Socioeconomic Environment

Short-term impacts to traffic flow will occur as a result of project construction. These impacts will be travel delays as a result of widening the road along its existing alignment. During the design of the project, traffic control plans will be developed that will ensure that negative impacts to traffic flow will be kept to a minimum and that access to all properties will be maintained during construction.

4.6.11.2 Physical Environment

The construction of the project will create short-term impacts to water quality. The impacts will be largely due to sedimentation resulting from the erosion of exposed soils in construction areas. The control of sedimentation and erosion on this project will be in compliance with the Memorandum of Understanding between the NCDOT, the NCDEHNR, and the North Carolina Sedimentation Control Regulations (NC Administrative Code, Title 15, Chapter 4). Erosion and sedimentation control measures employed will also be in conformance with the guidelines of *Federal-aid Highway Program Manual*, Volume 6-7-3. An erosion and sedimentation control plan will be filed at least thirty days prior to the commencement of construction. The best management practices will be applied during the construction period to control potential erosion and sedimentation. These measures include staked hay or fabric siltation barriers, temporary mulching and sodding, sediment catch basins, and diversion berms. The exposure of cleared areas and erodible earth will be minimized to the greatest extent possible by phasing construction activities. Wherever feasible, construction control measures will be incorporated as permanent features in the highway's design.

Additional impacts to wetlands may be anticipated from construction activities. These impacts would most likely be associated with the destruction or disturbance of wetland vegetation adjacent to the toes of fill slopes. Such disturbance cannot be feasibly avoided. The revegetation of such areas is expected to be relatively rapid.

Construction of the proposed roadway will result in minor displacement of wildlife. This will result from the clearing of habitat and from noise and vibration from construction equipment. Animals which are displaced from the right of way may compete with those in habitats adjacent to the right of way.

Sites located close to construction activities can be expected to experience a temporary increase in noise levels and vibration. The proposed construction activities will not require blasting. Mitigation of construction noise and vibration will be accomplished during the development of a construction noise control plan. This plan will include measures such as the limiting of certain construction activities or equipment use during the evenings, weekends, or holidays; the location of storage and staging areas away from noise sensitive sites; and techniques to shield stationary equipment.

Construction activities will cause minor, short-term air quality impacts in the form of dust from earthwork on unpaved roads, and smoke from open burning. The rapid completion of earth moving activities followed by mulching and seeding of disturbed area will minimize airborne particulates. Efforts to preserve vegetation will also help control dust. These impacts will be minimized by adherence to all state and local regulations.

Not all construction activities will occur within the roadway right of way. It may be necessary to stockpile materials outside of the right of way, and construction easements may be required to assure efficient access to construction sites by heavy equipment. Other off-site activities required may involve excavation of borrow pits and the construction of temporary asphalt plants. All of these off-site activities will be temporary in nature, with the exception of excavated borrow pits. Due to the preliminary nature of the information developed during this study, it is not possible to identify the extent and location of required off-site activities.

NC 49

FROM THE EXISTING FOUR LANE SECTION NEAR UNCC
TO APPROXIMATELY 1000 FEET EAST OF SR 1300 IN HARRISBURG
MECKLENBURG AND CABARRUS COUNTIES
FEDERAL-AID PROJECT NO. F-28-1(4)
STATE PROJECT NO. 8.1672601
T.I.P. NO. R-2215

Section 5

5.0 COMMENTS AND COORDINATION

The following section describes the process that was used to solicit citizen involvement and to coordinate the project with public and government agencies.

5.1 Public Involvement Program

In order to ensure adequate public and agency participation in the study process, a Public Involvement Program was developed. The program consisted of two informal public information meetings. Members of the project team met with public officials prior to both of the information meetings. In addition, members of the project team have been available for presentations to small organizations or groups and to respond to telephone and mail inquiries. A mailing list of interested parties has been maintained.

The first Public Information Meeting was held on June 20, 1990, from 6:00 PM to 8:00 PM at Harrisburg Elementary School in Harrisburg, North Carolina. The purpose of the meeting was to provide general information on the scope of the project and to initiate public input. The meeting was informal and without lengthy presentations. The project team was available to answer questions and provide information, on a one-to-one basis, to citizens visiting the meeting site. The attendees consisted of residents and/or homeowners in the study area as well as representatives from local government agencies. Most of the questions from the meeting focused on the project schedule, right of way requirements, and the status of the Harrisburg By-pass. All comments were compiled and are available for review at the NCDOT Planning and Environmental Branch offices in Raleigh, North Carolina.

The second Public Information meeting was held on February 5, 1991, from 6:00 PM to 8:00 PM at the Harrisburg Elementary School Media Center in Harrisburg, North Carolina. The purpose of the meeting was to present the alternative selected for preliminary design. The format of the meeting was identical to the first public meeting. Most of the attendees were residents and/or homeowners in the project area. The questions and comments from the meeting focused on the schedules for NC 49 and the

Outer Loop, status of the Harrisburg Bypass, and construction impacts. All comments were compiled and are available for review.

All comments and requests from the public meetings have been reviewed and addressed. Members of the project team have continued to be available to respond to comments and requests for information. A public hearing will be conducted following the review and the public availability period of this Environmental Assessment.

5.2 Interagency Coordination

A scoping letter was distributed to relevant local, state, and Federal agencies in late May 1990 to solicit their comments and to initiate coordination for the NC 49 improvement study. The agencies that were contacted are listed below. A copy of the scoping letter is included on the following pages. Copies of agency response letters are contained in Appendix C.

*NC Department of Administration
*NC Department of Cultural Resources
NC Department of Human Resources
*NC Department of Public Instruction
*NC Department of Environment, Health, and Natural Resources
*Army Corps of Engineers - Wilmington
Environmental Protection Agency, Region IV - Atlanta, GA
*Fish and Wildlife Service, Endangered Species - Asheville
Fish and Wildlife Service, Fish and Wildlife Enhancement - Raleigh
Geological Survey - Raleigh
*Soil Conservation Service - Raleigh
Region D Council of Governments
Mayor of Harrisburg
Cabarrus County Commissioner - Chairman
Mecklenburg County Commissioner - Chairman
*Cabarrus County Manager
*Mecklenburg County Manager

* - indicates input was received by these agencies.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201
RALEIGH 27611-5201

JAMES G. MARTIN
GOVERNOR

THOMAS J. HARRELSON
SECRETARY

DIVISION OF HIGHWAYS

GEORGE E. WELLS, P.E.
STATE HIGHWAY ADMINISTRATOR

May 29, 1990

MEMORANDUM TO: (s00)

FROM: L. J. Ward, P. E.
Manager, Planning and Research Branch

RE: Federal Environmental Assessment for NC 49 from the Existing 4-lane Section Near UNCC to 1000 Feet East of SR 1300 in Harrisburg, Mecklenburg and Cabarrus Counties, State Project No. 8.1672601, Federal-Aid No. F-28-1(4), TIP No. R-2215

The North Carolina Department of Transportation (NCDOT), Division of Highways, has retained the firm of PAI Associates, Charlotte, North Carolina, to prepare a Federal Environmental Assessment for the proposed improvements to NC 49 from the existing four-lane section at UNCC in Mecklenburg County to approximately 1000 feet east of SR 1300 in the town of Harrisburg. The length of the project is approximately four miles.

The purpose of this letter is to solicit input from agencies and individuals concerning the potential impact of the proposed project upon any structure or feature in proximity to the project and the impact of this project upon social, economic, demographic, land use or environmental conditions. Alternates will be investigated and evaluated including a four-lane median divided section and a five-lane section in urban areas. It is anticipated that additional right-of-way will be required for the project. No control of access is expected for the proposed project. A map is attached which shows the study area.

The proposed improvements are included in the 1990-1996 Transportation Improvement Program (T.I.P.) Right-of-Way acquisition is scheduled to begin in Fiscal Year 1993 with construction scheduled to begin in Fiscal Year 1995.

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The existing roadway basically consist of a two-lane section with a 24-foot pavement and 10-foot shoulders. East of SR 2833 at UNCC, the road widens to a median divided facility with two 32-foot pavements and 10-foot shoulders that extends to the west. The median width is 44 feet. In Harrisburg, the road widens to a curb and gutter section with a pavement width of approximately 67 feet, east of SR 1300. There is no control of access.

A reconnaissance survey of the project area reveals the following specific aspects or subjects of potential impact:

1. Development within the project study area consist of a mixture of farmland, woodlands, rural residential and commercial/industrial. No neighborhoods will be split or disrupted by the project.

2. There are at least three churches and two cemeteries located along the route.

3. A railroad running parallel to the existing facility for approximately one mile is located on the south side of the road.

4. Duke Power substation is located within the project limits.

5. The signalized intersections along the project are SR 2833 (Mallard Creek Church Road), SR 1173 and SR 1300. The other intersections along the project are stop sign controlled and will remain so unless future traffic warrants installation of a signal.

6. There are service stations in operation along the project. An analysis of underground tanks at these sites will be conducted to determine if any potential impacts will occur with the proposed widening of the roadway.

Field investigation and evaluations will be conducted to identify aquatic and biotic communities in the project area and to assess the impact of the proposed project on these communities. No federally-listed endangered species of plants or animals are know at this time to be in the study area. The corridor will be reviewed in the field for the presence of federally-listed or state-listed threatened or endangered species.

An archaeological survey conducted for the Charlotte Eastern Outer Loop included the limits of the NC 49 project. As a result, the State Historic Preservation Office concurred that no archaeological surveys will be necessary as part of this project. A historic resource study will be conducted to determine the presence of any National Register sites. The historical resource survey will be conducted in compliance with state and federal regulations.

Please note that there will be no formal interagency scoping meeting for this project. This letter, therefore, constitutes solicitation for scoping comments related to this project.

In order that we may fully evaluate the impacts of the proposed project, it is requested that you respond in writing concerning any beneficial or adverse impacts of the proposed project relating to the interest of your agency. For our consultants to stay on schedule and for your input to be included in their draft report, please respond by July 9, 1990.

If you have any questions concerning this project, please contact Ms. Leigh Cobb of our office (telephone 919-733-7842).

Sincerely,

L. J. Ward, P. E.
Manager, Planning and Research Branch

LC/wp

LIST OF STATE AGENCIES

Mrs. Chrys Baggett, Director
State Clearinghouse
Dept. of Administration

Dr. William S. Price
Division of Archives and History
Dept. of Cultural Resources

Mr. Howard Ellis
Division of Health Services
Dept. of Human Resources

Dr. Charles H. Weaver
Division of School Planning
Dept. of Public Instruction

Ms. Melba McGee
Environmental Assessment Section
Dept. of Environment, Health, & Natural Resources

Mr. A. L. Hankins, Jr., P. E.
Hydrographics Unit

Mr. W. D. Johnson
Roadside Environmental Department

Mr. W. L. Moore, III
Geotechnical Unit

Mr. Horace Jernigan
Location & Survey Unit

Mr. A. D. Allison, II
Right of Way Branch

Mr. J. M. Lynch, P. E.
Traffic Engineering Branch

Dr. M. R. Poole. P. E.
Statewide Planning
Peden Steel Building

Mr. Curtis Yates
Bicycle Coordinator

Mr. W. G. Plentl
Director of Aeronautics

Mr. J. D. Goins
Division Engineer, Div. 10

FEDERAL AGENCY ADDRESS LIST

District Engineer
Army Corps of Engineers
Wilmington District
P. O. Box 1890
Wilmington, North Carolina 28402
0014

Environmental Review Branch
Environmental Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365
0015

Field Supervisor
Fish & Wildlife Service
Endangered Species Field Station
100 Otis Street, Room 224
Asheville, North Carolina 23801
0028

Field Supervisor
Fish & Wildlife Service
Fish & Wildlife Enhancement
P. O. Box 33726
Raleigh, North Carolina 27636-3726
0016

District Chief
Geological Survey
Century Station, Room 436
P. O. Box 2857
Raleigh, North Carolina 27602
0023

Mr. Bobbye J. Jones, State Conservationist
Soil Conservation Service
Federal Bldg.-Room 535
310 New Bern Avenue
Raleigh, North Carolina 27601
0012

Mr. Seddon Goode, Jr.
Two First Union Center
Suite 1980
Charlotte, North Carolina 28282

Executive Director
Region D Council of Governments
P. O. Bo 1820
Boone, North Carolina 28607

The Honorable Donald Fred Helms
Mayor of Harrisburg
P. O. Box 100
Harrisburg, North Carolina 28075

Mr. James W. Lentz
Chairman
Cabarrus County Commissioner
P. O. Box 664
Concord, North Carolina 28025

Ms. Carla Dupuy
Chairman
Mecklenburg County Commissioner
P. O. Box 31787
Charlotte, North Carolina 28231

Mr. Michael M. Ruffin
Cabarrus County Manager
P. O. Box 707
Concord, North Carolina 28025

Mr. Gerald G. Fox
Mecklenburg County Manager
P. O. Box 31787
Charlotte, North Carolina 28231

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Section 6

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APPENDICES

APPENDIX A
FARMLAND CONVERSION IMPACT RATING FORMS

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 10/09/90
Name Of Project NC 49/EA, STATE PROJ. #8.1672601, TIP # R-2215	Federal Agency Involved FEDERAL HIGHWAY ADMINISTRATION
Proposed Land Use HIGHWAY DEVELOPMENT	County And State MECKLENBURG & CABARRUS COUNTIES, N.C.
PART II *(To be completed by SCS)*	Date Request Received By SCS 10/09/90

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply — do not complete additional parts of this form).* Yes ☒ No ☐		Acres Irrigated 0	Average Farm Size 103
Major Crop(s) Corn	Farmable Land In Govt. Jurisdiction Acres: 292,368 % 86.9	Amount Of Farmland As Defined in FPPA Acres: 231,800 % 68.9	
Name Of Land Evaluation System Used Mecklenburg LE	Name Of Local Site Assessment System None	Date Land Evaluation Returned By SCS 10-10-90	

		Alternative Site Rating			
PART III *(To be completed by Federal Agency)*		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly		2.84	3.3	5.26	1.34
B. Total Acres To Be Converted Indirectly		0	0	0	0
C. Total Acres In Site		2.84	3.3	5.26	1.34
PART IV *(To be completed by SCS)* Land Evaluation Information					
A. Total Acres Prime And Unique Farmland		0	0	0	0
B. Total Acres Statewide And Local Important Farmland		2.84	3.3	5.26	1.34
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted		0.01	0.01	0.01	0.01
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value		68.9	68.9	68.9	68.9
PART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*		76	76	76	76
PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use		11	11	11	11
2. Perimeter In Nonurban Use		5	5	5	5
3. Percent Of Site Being Farmed		15	10	5	5
4. Protection Provided By State And Local Government		0	0	0	0
5. Distance From Urban Builtup Area		n/a	n/a	n/a	n/a
6. Distance To Urban Support Services		n/a	n/a	n/a	n/a
7. Size Of Present Farm Unit Compared To Average		5	5	5	5
8. Creation Of Nonfarmable Farmland		0	0	0	0
9. Availability Of Farm Support Services		5	5	5	5
10. On-Farm Investments		10	10	10	5
11. Effects Of Conversion On Farm Support Services		0	0	0	0
12. Compatibility With Existing Agricultural Use		5	5	5	5
TOTAL SITE ASSESSMENT POINTS	160	56	51	46	41
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	76	76	76	76
Total Site Assessment *(From Part VI above or a local site assessment)*	160	132	127	122	117
TOTAL POINTS *(Total of above 2 lines)*	260	132	127	122	117

Site Selected: Site "C"	Date Of Selection 2/91	Was A Local Site Assessment Used? Yes ☐ No ☒

Reason For Selection:

(1) Versus Sites A & D - Alternative Site C provides for a safer facility with a more desirable level-of-service for the projected traffic volumes.

(2) Versus Site B - Alternative Site C minimizes right-of-way impacts.

APPENDIX B
NCDOT RELOCATION REPORT

80656
scoping

RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE

RECEIVED
22 1990
DIVISION OF HIGHWAYS
PLANNING & RESEARCH

X E.I.S. ___ CORRIDOR ___ DESIGN

PROJECT: 8.1672601

I.D. NO.: R-2215

COUNTY: Mecklenburg & Cabarrus

F.A. PROJECT: ______

Alternate A Section 1

DESCRIPTION OF PROJECT: N.C. 49 From the Existing Four-Lane Section at UNC-C to 1000 Feet East of S.R. 1300

ESTIMATED DISPLACEES				
Type of Displacee	Owners	Tenants	Total	Minorities
Individuals	0	0	0	0
Families	5	24	29	8
Businesses	1	0	1	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL				
0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	0
24	3	2	0	0

VALUE OF DWELLING				DSS DWELLINGS AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	4	150-250	0	20-40M	26	150-250	14
40-70M	0	250-400	0	40-70M	114	250-400	26
70-100	1	400-600	24	70-100	160	400-600	33
100 UP	0	600 UP	0	100 UP	252	600 UP	18
TOTAL	5		24		552		91

ANSWER ALL QUESTIONS

YES	NO	EXPLAIN ALL "YES" ANSWERS
	X	1. Will special relocation services be necessary
	X	2. Will schools or churches be affected by displacement
X		3. Will business services still be available after project
X		4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage
		6. Source for available housing (list)
	X	7. Will additional housing programs be needed
X		8. Should Last Resort Housing be considered
	X	9. Are there large, disabled, elderly, etc. families
		ANSWER THESE ALSO FOR DESIGN
		10. Will public housing be needed for project
		11. Is public housing available
		12. Is it felt there will be adequate DDS housing available during relocation period
		13. Will there be a problem of housing within financial means
		14. Are suitable business sites available (list source)
		15. Number months estimated to complete RELOCATION ______

REMARKS (Respond by Number)

3. NO PERMANENT DISPLACEMENT OF BUSINESSES.

4. A B.P. OIL COMPANY, 800 SQUARE FEET, APPROXIMATELY 6 EMPLOYEES, 2 MINORITIES.

6. M.L.S., NEWSPAPERS, REAL ESTATE PUBLICATIONS, AND REALTORS.

8. WILL BE ADMINISTERED ACCORDING TO STATE LAW.

D. A. McCallum
D. A. McCallum, Area Relocation Agent

10-16-90
Date

J B Williamson
Approved

10/22/9
Date

Form 15.4 Revised 5/90

Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

RELOCATION REPORT

X E.I.S. ___ CORRIDOR ___ DESIGN

North Carolina Department of Transportation
RELOCATION ASSISTANCE
Alternate A Section 1A

PROJECT: 8.1672601
I.D. NO.: R-2215
COUNTY: Mecklenburg & Cabarrus
F.A. PROJECT: ______

DESCRIPTION OF PROJECT: N.C. 49 From the Existing Four-Lane Section at UNC-C to 1000 Feet East of S.R. 1300

ESTIMATED DISPLACEES					INCOME LEVEL				
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP
Individuals	0	0	0	0	0	0	0	0	0
Families	2	0	2	0	0	0	2	0	0
Businesses	0	0	0	0					
Farms	0	0	0	0					
Non-Profit	0	0	0	0					

VALUE OF DWELLING				DSS DWELLINGS AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	26	150-250	14
40-70M	2	250-400	0	40-70M	114	250-400	26
70-100	0	400-600	0	70-100	160	400-600	33
100 UP	0	600 UP	0	100 UP	252	600 UP	18
TOTAL	2		0		552		91

ANSWER ALL QUESTIONS

YES	NO	EXPLAIN ALL "YES" ANSWERS
	X	1. Will special relocation services be necessary
	X	2. Will schools or churches be affected by displacement
X		3. Will business services still be available after project
	X	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage
		6. Source for available housing (list)
	X	7. Will additional housing programs be needed
X		8. Should Last Resort Housing be considered
	X	9. Are there large, disabled, elderly, etc. families
		ANSWER THESE ALSO FOR DESIGN
		10. Will public housing be needed for project
		11. Is public housing available
		12. Is it felt there will be adequate DDS housing available during relocation period
		13. Will there be a problem of housing within financial means
		14. Are suitable business sites available (list source)
		15. Number months estimated to complete RELOCATION ______

REMARKS (Respond by Number)

3. NO PERMANENT DISPLACEMENT OF BUSINESSES.

6. M.L.S., NEWSPAPERS, REAL ESTATE PUBLICATIONS, AND REALTORS.

8. WILL BE ADMINISTERED ACCORDING TO STATE LAW.

DA McCallum
D. A. McCallum, Area Relocation Agent
Form 15.4 Revised 5/90

10-16-90
Date

JBWilliamson Jr
Approved

10/22/90
Date

Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE

X E.I.S. ___ CORRIDOR ___ DESIGN

Alternate A Section 2

PROJECT: 8 1672601
COUNTY: Mecklenburg & Cabarrus
I.D. NO.: R-2215
F.A. PROJECT: ______

DESCRIPTION OF PROJECT: N.C. 49 From the Existing Four-Lane Section at UNC-C to 1000 Feet East of S.R. 1300

ESTIMATED DISPLACEES					INCOME LEVEL				
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP
Individuals	0	0	0	0	0	0	0	0	0
Families	2	0	2	0	0	0	2	0	0
Businesses	0	0	0	0					
Farms	0	0	0	0					
Non-Profit	0	0	0	0					

VALUE OF DWELLING				DSS DWELLINGS AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	26	150-250	14
40-70M	2	250-400	0	40-70M	114	250-400	26
70-100	0	400-600	0	70-100	160	400-600	33
100 UP	0	600 UP	0	100 UP	252	600 UP	18
TOTAL	2		0		552		91

ANSWER ALL QUESTIONS

YES	NO	EXPLAIN ALL "YES" ANSWERS
	X	1. Will special relocation services be necessary
	X	2. Will schools or churches be affected by displacement
X		3. Will business services still be available after project
	X	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage
		6. Source for available housing (list)
	X	7. Will additional housing programs be needed
X		8. Should Last Resort Housing be considered
	X	9. Are there large, disabled, elderly, etc. families
		ANSWER THESE ALSO FOR DESIGN
		10. Will public housing be needed for project
		11. Is public housing available
		12. Is it felt there will be adequate DDS housing available during relocation period
		13. Will there be a problem of housing within financial means
		14. Are suitable business sites available (list source)
		15. Number months estimated to complete RELOCATION ______

REMARKS (Respond by Number)

3. NO PERMANENT DISPLACEMENT OF BUSINESSES.

6. M.L.S., NEWSPAPERS, REAL ESTATE PUBLICATIONS, AND REALTORS.

8. WILL BE ADMINISTERED ACCORDING TO STATE LAW.

D. A. McCallum
D. A. McCallum, Area Relocation Agent
10-16-90
Date

J B Williamson Jr
Approved
10/22/9
Date

Form 15.4 Revised 5/90

Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE
Alternate A Section 3

X E.I.S. ___ CORRIDOR ___ DESIGN

PROJECT: 8.1672601
I.D. NO.: R-2215
COUNTY: Mecklenburg & Cabarrus
F.A. PROJECT: ______

DESCRIPTION OF PROJECT: N.C. 49 From the Existing Four-Lane Section at UNC-C to 1000 Feet East of S.R. 1300

ESTIMATED DISPLACEES				
Type of Displacee	Owners	Tenants	Total	Minorities
Individuals	0	0	0	0
Families	3	24	27	8
Businesses	0	0	0	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL				
0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	0
24	1	2	0	0

VALUE OF DWELLING				DSS DWELLINGS AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	2	150-250	0	20-40M	26	150-250	14
40-70M	0	250-400	0	40-70M	114	250-400	26
70-100	1	400-600	24	70-100	160	400-600	33
100 UP	0	600 UP	0	100 UP	252	600 UP	18
TOTAL	3		24		552		91

ANSWER ALL QUESTIONS
EXPLAIN ALL "YES" ANSWERS

YES	NO	
	X	1. Will special relocation services be necessary
	X	2. Will schools or churches be affected by displacement
X		3. Will business services still be available after project
	X	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage
		6. Source for available housing (list)
	X	7. Will additional housing programs be needed
X		8. Should Last Resort Housing be considered
	X	9. Are there large, disabled, elderly, etc. families
		ANSWER THESE ALSO FOR DESIGN
		10. Will public housing be needed for project
		11. Is public housing available
		12. Is it felt there will be adequate DDS housing available during relocation period
		13. Will there be a problem of housing within financial means
		14. Are suitable business sites available (list source)
		15. Number months estimated to complete RELOCATION ______

REMARKS (Respond by Number)

3. NO PERMANENT DISPLACEMENT OF BUSINESSES.

6. M.L.S., NEWSPAPERS, REAL ESTATE PUBLICATIONS, AND REALTORS.

8. WILL BE ADMINISTERED ACCORDING TO STATE LAW.

D. A. McCallum, Area Relocation Agent — 10-16-90 Date

Approved — 10/22/9 Date

Form 15.4 Revised 5/90

Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

RELOCATION REPORT

X E.I.S. ___ CORRIDOR ___ DESIGN

North Carolina Department of Transportation
RELOCATION ASSISTANCE
Alternate A2

PROJECT: 8.1672601
I.D. NO.: R-2215
COUNTY: Mecklenburg & Cabarrus
F.A. PROJECT: ______

DESCRIPTION OF PROJECT: N.C. 49 From the Existing Four-Lane Section at UNC-C to 1000 Feet East of S.R. 1300

ESTIMATED DISPLACEES				
Type of Displacee	Owners	Tenants	Total	Minorities
Individuals	0	0	0	0
Families	2	0	2	0
Businesses	4	0	4	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL				
0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	0
0	0	2	0	0

VALUE OF DWELLING				DSS DWELLINGS AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	26	150-250	14
40-70M	2	250-400	0	40-70M	114	250-400	26
70-100	0	400-600	0	70-100	160	400-600	33
100 UP	0	600 UP	0	100 UP	252	600 UP	18
TOTAL	2		0		552		91

ANSWER ALL QUESTIONS
EXPLAIN ALL "YES" ANSWERS

YES	NO	
	X	1. Will special relocation services be necessary
	X	2. Will schools or churches be affected by displacement
X		3. Will business services still be available after project
X		4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage
		6. Source for available housing (list)
	X	7. Will additional housing programs be needed
X		8. Should Last Resort Housing be considered
	X	9. Are there large, disabled, elderly, etc. families
		ANSWER THESE ALSO FOR DESIGN
		10. Will public housing be needed for project
		11. Is public housing available
		12. Is it felt there will be adequate DDS housing available during relocation period
		13. Will there be a problem of housing within financial means
		14. Are suitable business sites available (list source)
		15. Number months estimated to complete RELOCATION ______

REMARKS (Respond by Number)

3. NO PERMANENT DISPLACEMENT OF BUSINESSES.

4.
   A. J & J TAVERN, 1200 SQUARE FEET, 4 EMPLOYEES 1 MINORITY
   B. REPUBLIC ROOFING & SUPPLY CO., 900 SQUARE FEET, 8 EMPLOYEES, 3 MINORITIES
   C. STEWART PUMP & WELL, 1500 SQUARE FEET, 8 EMPLOYEES, 3 MINORITIES
   D. WINDSOR & JERALD MFG. COMPANY, 2400 SQUARE FEET, 18 EMPLOYEES, 6 MINORITIES

6. M.L.S., NEWSPAPERS, REAL ESTATE PUBLICATIONS, AND REALTORS.

8. WILL BE ADMINISTERED ACCORDING TO STATE LAW.

D.A. McCallum
D. A. McCallum, Area Relocation Agent
Form 15.4 Revised 5/90

10-16-90
Date

J B Williamson Jr
Approved

10/22/9
Date

Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

RELOCATION REPORT

X E.I.S. ___ CORRIDOR ___ DESIGN

North Carolina Department of Transportation
RELOCATION ASSISTANCE
Alternate A3

PROJECT: 8 1672601
I.D. NO: R-2215
COUNTY: Mecklenburg & Cabarrus
F.A. PROJECT: ______

DESCRIPTION OF PROJECT: N.C. 49 From the Existing Four-Lane Section at UNC-C to 1000 Feet East of S.R. 1300

ESTIMATED DISPLACEES

Type of Displacee	Owners	Tenants	Total	Minorities
Individuals	0	0	0	0
Families	3	0	3	0
Businesses	2	1	3	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	0
0	0	3	0	0

VALUE OF DWELLING				DSS DWELLINGS AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	26	150-250	14
40-70M	3	250-400	0	40-70M	114	250-400	26
70-100	0	400-600	0	70-100	160	400-600	33
100 UP	0	600 UP	0	100 UP	252	600 UP	18
TOTAL	3		0		552		91

ANSWER ALL QUESTIONS

EXPLAIN ALL "YES" ANSWERS

YES	NO	
	X	1. Will special relocation services be necessary
	X	2. Will schools or churches be affected by displacement
X		3. Will business services still be available after project
X		4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage
		6. Source for available housing (list)
	X	7. Will additional housing programs be needed
X		8. Should Last Resort Housing be considered
	X	9. Are there large, disabled, elderly, etc. families

ANSWER THESE ALSO FOR DESIGN

YES	NO	
		10. Will public housing be needed for project
		11. Is public housing available
		12. Is it felt there will be adequate DDS housing available during relocation period
		13. Will there be a problem of housing within financial means
		14. Are suitable business sites available (list source)
		15. Number months estimated to complete RELOCATION ______

REMARKS (Respond by Number)

3. NO PERMANENT DISPLACEMENT OF BUSINESSES.

4.
   A. THIS & THAT, (CRAFTS), 100 SQUARE FEET, 1 EMPLOYEE, NO MINORITY.
   B. "76" STATION, 1000 SQUARE FEET, 3 EMPLOYEES 1 MINORITY.
   C. PRODUCE STAND, 400 SQUARE FEET, 2 EMPLOYEES, 1 MINORITY.

6. M.L.S., NEWSPAPERS, REAL ESTATE PUBLICATIONS, AND REALTORS.

8. WILL BE ADMINISTERED ACCORDING TO STATE LAW.

D.A. McCallum
D. A. McCallum, Area Relocation Agent

10-16-90
Date

J.B. Williams Jr
Approved

10/22/9
Date

Form 15.4 Revised 5/90

Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE

X E.I.S. ☐ CORRIDOR ☐ DESIGN

Alternate A4

PROJECT: 8.1672601
I.D. NO.: R-2215
COUNTY: Mecklenburg & Cabarrus
F.A. PROJECT: ______

DESCRIPTION OF PROJECT: N.C. 49 From the Existing Four-Lane Section at UNC-C to 1000 Feet East of S.R. 1300

ESTIMATED DISPLACEES					INCOME LEVEL				
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP
Individuals	0	0	0	0	0	0	0	0	0
Families	0	0	0	0	0	0	1	0	0
Businesses	0	0	0	0					
Farms	0	0	0	0					
Non-Profit	0	0	0	0					

VALUE OF DWELLING				DSS DWELLINGS AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	26	150-250	14
40-70M	0	250-400	0	40-70M	114	250-400	26
70-100	0	400-600	0	70-100	160	400-600	33
100 UP	0	600 UP	0	100 UP	252	600 UP	18
TOTAL	0		0		552		91

ANSWER ALL QUESTIONS

YES	NO	EXPLAIN ALL "YES" ANSWERS
	X	1 Will special relocation services be necessary
	X	2. Will schools or churches be affected by displacement
X		3. Will business services still be available after project
	X	4 Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage
		6 Source for available housing (list)
	X	7 Will additional housing programs be needed
	X	8 Should Last Resort Housing be considered
	X	9 Are there large, disabled, elderly, etc. families
		ANSWER THESE ALSO FOR DESIGN
		10 Will public housing be needed for project
		11 Is public housing available
		12 Is it felt there will be adequate DDS housing available during relocation period
		13 Will there be a problem of housing within financial means
		14 Are suitable business sites available (list source)
		15 Number months estimated to complete RELOCATION ______

REMARKS (Respond by Number)

3. NO BUSINESS WILL BE DISPLACED.

6. M.L.S., NEWSPAPERS, REAL ESTATE PUBLICATIONS, AND REALTORS.

D.A. McCallum
D. A. McCallum, Area Relocation Agent
Form 15 4 Revised 5/90

10-16-90
Date

JB Williams Jr.
Approved

10/22/9
Date

Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

RELOCATION REPORT

X E.I.S. ___ CORRIDOR ___ DESIGN

North Carolina Department of Transportation
RELOCATION ASSISTANCE
Alternate B Section 1

PROJECT: 8.1672601
I.D. NO.: R-2215
COUNTY: Mecklenburg & Cabarrus
F.A. PROJECT: ______

DESCRIPTION OF PROJECT: N.C. 49 From the Existing Four-Lane Section at UNC-C to 1000 Feet East of S.R. 1300

ESTIMATED DISPLACEES					INCOME LEVEL				
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP
Individuals	0	0	0	0	0	0	0	0	0
Families	1	0	1	0	0	0	1	0	0
Businesses	1	0	1	0					
Farms	0	0	0	0					
Non-Profit	0	0	0	0					

VALUE OF DWELLING				DSS DWELLINGS AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	26	150-250	14
40-70M	1	250-400	0	40-70M	114	250-400	26
70-100	0	400-600	0	70-100	160	400-600	33
100 UP	0	600 UP	0	100 UP	252	600 UP	18
TOTAL	1		0		552		91

YES	NO	ANSWER ALL QUESTIONS EXPLAIN ALL "YES" ANSWERS
	X	1. Will special relocation services be necessary
	X	2. Will schools or churches be affected by displacement
X		3. Will business services still be available after project
X		4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage
		6. Source for available housing (list)
	X	7. Will additional housing programs be needed
X		8. Should Last Resort Housing be considered
	X	9. Are there large, disabled, elderly, etc. families
		ANSWER THESE ALSO FOR DESIGN
		10. Will public housing be needed for project
		11. Is public housing available
		12. Is it felt there will be adequate DDS housing available during relocation period
		13. Will there be a problem of housing within financial means
		14. Are suitable business sites available (list source)
		15. Number months estimated to complete RELOCATION ______

REMARKS (Respond by Number)

3. NO PERMANENT DISPLACEMENT OF BUSINESSES.

4.
   A. BODY SHOP, 1500 SQUARE FEET, 3 EMPLOYEES, 1 MINORITY.

6. M.L.S., NEWSPAPERS, REAL ESTATE PUBLICATIONS, AND REALTORS.

8. WILL BE ADMINISTERED ACCORDING TO STATE LAW.

McCallum
D. A. McCallum, Area Relocation Agent

10-16-90
Date

Williams Jr
Approved

10/22/9
Date

Form 15.4 Revised 5/90

Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE

X E.I.S. ___ CORRIDOR ___ DESIGN

PROJECT: 8.1672601 COUNTY: Mecklenburg & Cabarrus Alternate B Section 2

I.D. NO.: R-2215 F.A. PROJECT: ______

DESCRIPTION OF PROJECT: N.C. 49 From the Existing Four-Lane Section at UNC-C to 1000 Feet East of S.R. 1300

ESTIMATED DISPLACEES				
Type of Displacee	Owners	Tenants	Total	Minorities
Individuals	0	0	0	0
Families	0	0	0	0
Businesses	0	0	0	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL					
	0-15M	15-25M	25-35M	35-50M	50 UP
Individuals	0	0	0	0	0
Families	0	0	1	0	0

VALUE OF DWELLING				DSS DWELLINGS AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	26	150-250	14
40-70M	0	250-400	0	40-70M	114	250-400	26
70-100	0	400-600	0	70-100	160	400-600	33
100 UP	0	600 UP	0	100 UP	252	600 UP	18
TOTAL	0		0		552		91

ANSWER ALL QUESTIONS		
YES	NO	EXPLAIN ALL "YES" ANSWERS
	X	1. Will special relocation services be necessary
	X	2. Will schools or churches be affected by displacement
X		3. Will business services still be available after project
	X	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage
		6. Source for available housing (list)
	X	7. Will additional housing programs be needed
		8. Should Last Resort Housing be considered
	X	9. Are there large, disabled, elderly, etc. families
		ANSWER THESE ALSO FOR DESIGN
		10. Will public housing be needed for project
		11. Is public housing available
		12. Is it felt there will be adequate DDS housing available during relocation period
		13. Will there be a problem of housing within financial means
		14. Are suitable business sites available (list source)
		15. Number months estimated to complete RELOCATION ______

REMARKS (Respond by Number)

3. NO BUSINESSES WILL BE DISPLACED.

6. M.L.S., NEWSPAPERS, REAL ESTATE PUBLICATIONS, AND REALTORS.

D.A. McCallum 10-16-90
D. A. McCallum, Area Relocation Agent Date

C B Williams Jr. 10/22/90
Approved Date

Form 15.4 Revised 5/90

Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

APPENDIX C
AGENCY RESPONSES

90656 Scoping

208 06/29/90

NORTH CAROLINA - ATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
116 WEST JONES STREET
RALEIGH NORTH CAROLINA 27611

7/26/90

INTERGOVERNMENTAL REVIEW COMMENTS

MAILED TO

N.C. DEPT. OF TRANSPORTATION
L.J. WARD
PLANNING & RESESARCH BRANCH
HIGHWAY BLDG/INTER-OFFICE

FROM

MRS. CHRYS BAGGETT
DIRECTOR
N C STATE CLEARINGHOUSE

PROJECT DESCRIPTION

SCOPING FOR COMMENTS ON IMPACT OF PROPOSED IMPROVEMENTS TO NC 49 FROM THE EXISTING 4-LANE SECTION NEAR UNCC TO 1000 FEET EAST OF SR 1300 IN HARRISBURG, NC

SAI NO 90E42200950 PROGRAM TITLE - SCOPING

THE ABOVE PROJECT HAS BEEN SUBMITTED TO THE NORTH CAROLINA INTERGOVERNMENTAL REVIEW PROCESS. AS A RESULT OF THE REVIEW THE FOLLOWING IS SUBMITTED ( ) NO COMMENTS WERE RECEIVED

(X) COMMENTS ATTACHED

SHOULD YOU HAVE ANY QUESTIONS, PLEASE CALL THIS OFFICE (919) 733-0499.

C.C. REGION F

RECEIVED
JUL 25 1990

North Carolina Department of Cultural Resources

James G. Martin, Governor
Patric Dorsey, Secretary

Division of Archives and History
William S. Price, Jr., Director

April 4, 1991

Nicholas L. Graf
Division Administrator
Federal Highway Administration
U.S. Department of Transportation
P. O. Box 26806
Raleigh, N.C. 27611

Re: Section 106 Consultation
Historic Structures Report for NC 49 from
existing four lane divided section at UNC-C
to 1000 feet east of SR 1300, Mecklenburg and
Cabarrus Counties, ER 91-7943, State Project
8.1672601, TIP R-2215

Dear Mr. Graf:

Thank you for your letter of March 20, 1991, concerning the above project. We have reviewed the historic structures survey report by Ruth Little and offer our comments.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following properties are not eligible for listing in the National Register of Historic Places for the reasons cited:

Roland House (Site 1). The house has no special architectural or historical significance.

J. Roland Cochran Farm (Site 2). The farm has no special architectural or historical significance.

Back Creek Associate Reform Presbyterian Church (Site 3). The property's integrity has been compromised by a recent addition.

Back Creek Parsonage (Site 4). Deterioration of the house has compromised its integrity. The house has no special historical significance.

(Former) Back Creek School (Site 5). The structure has lost its integrity, because it was moved and rebuilt with reused materials.

Helms House (Site 6). The house has no special architectural or historical significance.

Stroup Farm (Site 7). The farmhouse has undergone numerous character-altering changes. It has no special architectural or historical significance.

Samuel H. Johnson Dairy Farm (Site 9). The farm has no special architectural significance.

Henry Williams Farm (Site 10). The farm has no special architectural or historical significance.

Harrisburg Presbyterian Church Cemetery (Site 11). The designs of the gravestones are typical of the early twentieth century and have no distinctive characteristics.

Until additional information for the property listed below is provided, we are unable to make a determination of its eligibility for listing in the National Register:

Banks Cochran Farm (Site 8).

In general the report meets our office's guidelines and those of the Secretary of the Interior. Specific concerns and/or corrections which need to be addressed in the preparation of a final report are attached for the author's use.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

Sincerely,

David Brook

David Brook
Deputy State Historic Preservation Officer

DB:slw

Attachment

cc: L. J. Ward
B. Church
Presnell Associates, Inc.
Ruth Little

ATTACHMENT

Historic Structures Report for NC 49 from existing four-lane divided section at UNC-C to 1000 feet east of SR 1300, Mecklenburg and Cabarrus Counties, ER 91-7943, State Project 8.1672601, TIP R-2215

Specific concerns regarding the report:

Banks Cochran Farm (Site B). We agree with the architectural evaluation, but we cannot assess the agricultural significance, largely because no dates are given for the agricultural buildings. The evaluation states that the farm operated during the 1940s heyday of dairy farming in Mecklenburg County and that insufficient time has passed to place the property in that context. The background states, however, that the house was built, and we assume the farm established, in 1932. If this is true, and most of the barns date from the 1930s, the farm might be important as a reflection of the emerging dairy industry in the county. There should be some statistics on dairy farming during this period. You may wish to review the agricultural context developed for the Ballentine Dairy Farm in Wake County (part of the Jones-Johnson-Ballentine Historic District).

Samuel H. Johnson Dairy Farm (Site 9). We agree with the not National Register eligible evaluation for this property. However, the above comments regarding context also apply to the Johnson Dairy Farm. In this case most of the barns are less than fifty years old.

North Carolina Department of Cultural Resources

James G. Martin, Governor
Patric Dorsey, Secretary

Division of Archives and History
William S. Price, Jr., Director

May 14, 1991

Nicholas L. Graf
Division Administrator
Federal Highway Administration
U.S. Department of Transportation
P. O. Box 26806
Raleigh, N.C. 27611

Re: Section 106 Consultation
Revised Historic Structures Survey Report for NC 49 from existing four-lane divided section at UNC-C to 1000 feet east of SR 1300, Cabarrus and Mecklenburg Counties, ER 91-8099, State Project No. 8.1672601, R-2215

Dear Mr. Graf:

Thank you for your letter of April 29, 1991, concerning the above project.

We have reviewed the revised historic structures survey report and concur that the Banks Cochran Farm (Site 8) is not eligible for listing in the National Register of Historic Places. We would like to note that the additional context Ruth Little provided for dairy farming is excellent.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

Sincerely,

David Brook

David Brook
Deputy State Historic Preservation Officer

DB:slw

cc: L. J. Ward
B. Church
Presnell Associates, Inc.
Ruth Little

RECEIVED
MAY 22 1991
PRESNELL ASSOC.

109 East Jones Street • Raleigh, North Carolina 27611
(919) 733-7305

CC: [illegible]
[illegible] 4/5/

North Carolina Department of Cultural Resources

James G. Martin, Governor
Patric Dorsey, Secretary

Division of Archives and History
William S. Price, Jr., Director

March 12, 1990

MEMORANDUM

TO: H. Franklin Vick, Assistant Manager
Planning and Research Branch
Division of Highways
Department of Transportation

FROM: David Brook, Deputy State
Historic Preservation Officer David Brook

SUBJECT: Improvements to NC 49 from UNC-Charlotte to
Harrisburg, R-2215, Mecklenburg and Cabarrus
Counties, ER 90-7889

Thank you for your letter of February 19, 1990, concerning the above project.

Recorded as part of the East Charlotte Outer Loop survey, sites 31Mk417 and 31Mk419 are located close to the right-of-way towards the College Park Church end of the project area. While no further work was recommended for 31Mk419, 31Mk417 is to be tested to determine its National Register eligibility. We are awaiting these results. Our letter of January 16, 1990, is attached for your information.

No other sites have been recorded near the project corridor. We agree that the likelihood for locating significant archaeological sites within the acquired 100-foot by 4.2-mile swath is low. Therefore, we recommend that no additional archaeological investigations be conducted in connection with this widening improvement project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Ms. Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

RECEIVED
JUL 25 1990

DB:slw

Attachment

bc: Claggett/Myers
County
RF

109 East Jones Street • Raleigh, North

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Land Resources

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Charles H. Gardner
Director

JUL 1990
RECEIVED
[illegible] OFFICE

MEMORANDUM

Date: June 5, 1990

To: Melba McGee

From: Randy Cotten RC

Thru: Gary Thompson GWT

Subject: Mecklenburg, Cabarrus Counties, NC 49 from the existing 4-lane section near UNCC to 1000 feet East of SR 1300 in Harrisburg,
State Project No. 8.1672601, T.I.P. No. R-2215
Federal Aid No. F-28-1(4)

We have reviewed the above referenced project and find that 15 geodetic survey markers will be impacted.

The N.C. Geodetic Survey should be contacted at P.O. Box 27687, Raleigh, N.C. 27611, (919) 733-3836 prior to construction. Intentional destruction of a geodetic monument is a violation of N.C. General Statute 102-4.

GWT/ajs
cc: Joe Creech, NCDOT

RECEIVED
JUL 25 1990

P.O. Box 27687 • Raleigh, N.C. 27611-7687 • Telephone (919) 733-3833

An Equal Opportunity Affirmative Action Employer

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Water Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
William W. Cobey, Jr., Secretary

John N. Morris
Director

JUL 1990
RECEIVED

June 7, 1990

MEMORANDUM

TO: Melba McGee

FROM: John Sutherland

SUBJECT: 90-0950, Improving NC 49 near UNCC

We have the following comments on the above project:

1. At stream and wetland crossings, utilize bridges whenever possible to minimize habitat losses and floodplain encroachment.
2. Minimize the loss of timber and prime farmland.
3. Provide vegetation buffers when highway passes close to residential areas.
4. Mitigate the loss of wetlands and forests.
5. Minimize the use of curb and gutter; maximize the use of porous pavement and grass swales.
6. Involve local landowners in gathering data on impacts; be flexible on location of alternatives - adjust them to meet local concerns.

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JUL 25 1990

P.O. Box 27687 Raleigh, North Carolina 27611-7687 Telephone 919-733-4064

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JUL 25 1990

JUN 1990
NRCD
PLANNING & ASSESSMENT

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Forest Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Harry F. Layman
Director

cc: R Goldstein

Griffiths Forestry Center
2411 Garner Road
Clayton, North Carolina 27520
June 7, 1990

MEMORANDUM

TO: Melba McGee
Environmental Assessment Unit

FROM: Don H. Robbins
Staff Forester DHR

SUBJECT: Federal EA for NC 49 from the Existing 4-lane Section Near UNCC to 1000 Feet East of SR 1300 in Harrisburg, Mecklenburg and Cabarrus Counties, North Carolina

PROJECT #90-0950

DUE DATE 6-19-90

To better determine the impact to forestry and greenways in the area of the proposed project, the Federal Environmental Assessment should contain the following information concerning the proposed improvements for the possible right-of-way purchases for the project:

1. The number of total woodland acres that would be taken out of timber production as a result of new right-of-way purchases.
2. The acres breakdown of this woodland concerning present conditions such as clear-cut areas, young growing timber, and fully stocked stands of very productive timber within the new right-of-way purchases for disturbed and undisturbed portions.
3. The site indexes of the forest soils that would be involved within the proposed right-of-way, so as to be able to determine the productivity of these forest soils in the area.
4. The number of woodland acres that would affect any watersheds in the area, if the woodland was removed.

P.O. Box 27687 • Raleigh, North Carolina 27611-7687 • Telephone 919-733-2162

An Equal Opportunity Affirmative Action Employer

5. With woodland involved, it is hoped that the timber could be merchandised and sold to lessen the need for piling and burning of debris during right-of-way construction.

   Provisions should be indicated in the EA that the contractor will make all efforts to salvage any merchantable timber to permit construction, once the contractor takes charge of the right-of-way.

6. The provisions that the contractor will take during the construction phase to prevent erosion, sedimentation and construction damage to the remaining standing trees outside of the right-of-way boundary and construction limits.

We would hope that the improvements would have the least impact to forest, related resources and greenways in that area.

DHR:

cc: Fred White
File

DIVISION OF PARKS AND RECREATION

June 13, 1990

JUN 1990

Memorandum

TO: Melba McGee

THROUGH: Carol Tingley CT

FROM: Stephen Hall, Natural Heritage Program

SUBJECT: Scoping -- Improve NC 49, Mecklenburg and Cabarrus Counties

REFERENCE: 90-0950

The route of the proposed highway project runs through a cluster of listed plant species located to either side of NC 49 in the vicinity of Back Creek Church. Species that have been recorded from within 0.5 miles of the project include prairie birdfoot-trefoil (Lotus purshianus), which is significantly rare in North Carolina and a candidate for federal listing; southern thimbleweed (Anemone berlandieri) and necklace sedge (Carex projecta), which are both candidates for state-listing; and dissected toothwort (Cardamine dissecta), which is considered significantly rare in North Carolina. In addition to this cluster, two other species have been observed in the vicinity of the project. Nestronia (Nestronia umbellula), a plant which is threatened in North Carolina and also a candidate for federal listing, has been recorded from the Back Creek watershed within three miles of the project, and blue wild indigo (Baptisia australis), which is significantly rare within the state, grows along SR 1161 less than two miles from the eastern terminus of the project.

The presence of this cluster of rare plant species is explainable by the nature of the soil in this area. Most of the ridge that runs along NC 49 is overlain with Iredell or Enon soils, both of which produce the circumneutral to basic soil pH that all these species prefer. Since the most of the project site is mapped as Iredell, there is a high potential for any of these species to occur throughout its limits. The trefoil, thimbleweed, and indigo can all occur in open areas, including highway rights-of-way. The toothwort and sedge should be looked for towards the base of the slope above Back Creek. Given the high potential for the occurrence of listed plant species, a careful field survey should be made by a qualified biologist working during the appropriate seasons of the year.

3161

RECEIVED

JUL 25 1990

Auxiliary Services
Charlotte-Mecklenburg Schools
Post Office Box 30035
Charlotte, North Carolina 28230
Telephone: (704) 379-7208

Peter D. Relic
Superintendent

RECEIVED
JUN 19 1990
DIVISION OF
SCHOOL PLANNING

June 15, 1990

Charles H. Weaver
Assistant State Superintendent
Auxiliary Services
116 West Edenton Street
Raleigh, North Carolina
27603-1712

Dear Charles,

In response to your letter of June 1 to Dr. Relic regarding the proposed improvements to NC 49, please be aware that Charlotte-Mecklenburg Schools intends to construct an Elementary School on the northwest corner of Harris-Houston Road (SR-2800)and NC 49 this year to open in August 1991. A middle school will be added to the 47 acre site within the next five years.

The proposed improvements to NC 49 will contribute significantly to the safe and even flow of traffic to and from this school site. We support this effort enthusiastically.

Thank you for the opportunity to comment on this most desirable road improvement project.

Sincerely,

Charles

Charles Allison III
Assistant Superintendent
Auxiliary Services

Administrative Offices Education Center 701 East Second Street

DEPARTMENT OF ENVIRONMENT, HEALTH
AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH

Project Number 90-0950
County Mecklenburg

Inter-Agency Project Review Response

Project Name NC 49 from Existing 4 lane UNCC to 1000 Feet E of SR1300 Type of Project Rd.

The following are our comments on the above referenced subject.

_____ The applicant should be advised that plans and specifications for all water system improvements must be approved by the Division of Environmental Health prior to the award of a contract or the initiation of construction (as required by 10 NCAC 10D .0900 et. seq.). For information, contact the Public Water Supply Section, (919) 733-2460.

✓ Several water lines possibly are located in the path of an adjacent to the proposed project. Due to a possible rupture during construction, the contractor should contact the appropriate water system officials to specify a work schedule.

_____ The proposed project will be constructed near water resources which are used for drinking. Precautions should be taken to prevent contamination of the watershed and stream by oil or other harmful substances. Additional information is available by contacting the Public Water Supply Section at (919) 733-2321.

_____ Back flow preventors should be installed on all incoming potable water lines. Additional information is available by contacting the Public Water Supply Section at (919) 733-2321.

_____ This project will be classified as a community public water supply and must comply with state and federal drinking water monitoring requirements. For more information the applicant should contact the Public Water Supply Section, (919) 733-2321.

_____ If this project is constructed as proposed, we will recommend closure of _____ feet of adjacent waters to the harvest of shellfish. For information regarding the shellfish sanitation program, the applicant should contact the Shellfish Sanitation Branch (919) 726-6827.

_____ The applicant should be advised to contact the local health department regarding their requirements for septic tank installations (as required under 10 NCAC 10A .1900 et. seq. and/or sanitary facilities requirements for this project if applicable.) For information concerning septic tank and other on-site waste disposal methods, contact the On-site Sewage Branch at (919) 733-2895.

✓ The applicant should be advised that prior to the removal or demolition of dilapidated structures, an extensive rodent control project may be necessary in order to prevent the migration of the rodents to adjacent areas. For information concerning rodent control, contact the local health department or the Public Health Pest Management Section (919) 733-6407.

✓ The spoil disposal area(s) proposed for this project may produce a mosquito breeding problem. For informaiton concerning appropriate mosquito control measures, the applicant should contact the Public Health Pest Management Section at (919) 733-6407.

Reviewer

Env Health/Water Supply
Branch/Unit

6/15/90
Date

RECEIVED
JUL 25 1990

Mooresville Regional Office - Land Quality Section

No known problems of concern to land quality other than adequate erosion and sediment control during the construction phase.

Groundwater - Any abandoned UST's encountered during construction should be reported to the Groundwater Section.

MECKLENBURG COUNTY

INTER-OFFICE COMMUNICATION

DATE: June 18, 1990

TO: Jerry Fox,
County Manager

FROM: Bobbie Shields,
Director of Engineering

SUBJECT: STATE APPLICATION #90-0950
IMPROVEMENTS TO NC 49

We have reviewed the attached and support the project. Traffic studies have shown the need to widen NC 49 in this area; we recommend that the location and need for a bypass around the north side of Harrisburg, as shown on the thoroughfare plan, be resolved.

Our Staff will work with the NC DOT and its consultants on this project.

Bobbie Shields

BS/ed
enclosure

JUL 1990
RECEIVED

RECEIVED
JUL 25 1990

906 SC
SCOPING

United States
Department of
Agriculture

Soil
Conservation
Service

4405 Bland Road, Suite 205
Raleigh, NC 27609
Telephone: (919) 790-2905

June 19, 1990

JUN 22 1990
PLANNING & RESEARCH

Mr. L. J. Ward, P.E.
Manager, Planning and Research Branch
N. C. Department of Transportation
P. O. Box 25201
Raleigh, NC 27611-5201

Re: Federal Environmental Assessment for NC 49 from the Existing 4-lane Section Near UNCC to 1000 Feet East of SR 1300 in Harrisburg, Mecklenburg and Cabarrus Counties, State Project No. 8.1672601, Federal Aid No. F-28-1(4), TIP No. R-2215

Dear Mr. Ward:

This is in response to your request for Important Farmland Information for the above project. We have enclosed a color coded soil survey map for the project area. The colors are defined as follows:

Green areas-All soil areas meet the soil criteria for Prime Farmland.

Orange areas-All soil areas meet the soil criteria for State Important Farmland.

The unmarked soil areas within the project area do not meet the soil criteria for Important Farmlands. As noted, both ends of the project area are unmarked. This is mainly because of their urban setting. Urban areas or planned urbanized areas do not qualify for important farmlands.

Sincerely,

Cecil W. Settle, Acting
Bobbye J. Jones
State Conservationist

cc: Hugh D. Price
Bruce T. Wilson

RECEIVED
JUL 11 1990

CC: [illegible]

DIVISION OF ENVIRONMENTAL MANAGEMENT

June 25, 1990

JUL 1990
RECEIVED
SECRETARY'S OFFICE
DOA

JUN 1990

MEMORANDUM

TO: Melba McGee

FROM: Steve Tedder

SUBJECT: Project No. 90-0950; Scoping Comments for Proposed Federal EA for NC 49 Improvements, Mecklenburg and Cabarrus Counties

The following DEM comments address potential impacts to water quality and wetlands that should be considered in the EA.

Surface Water Quality

There are no special surface waters of concern within the project boundaries such as those classified as WS (Water Supply), HQW (High Quality Waters) or ORW (Outstanding Resource Waters). However, NCDOT should still strive, where feasible, to minimize the water quality impacts of the project on even the Class C waters within the scope of the project boundaries that can result from highway construction and use.

Construction impacts can be reduced through strict adherence to required sediment control measures. Longer term nonpoint source impacts associated with highway use can be minimized by avoiding use of curb and gutter, which traps pollutants on the road surface and pipes them to receiving waters, and instead giving consideration to a section which features vegetated filter strips along either side of the road which can remove some pollutants prior to their reaching a surface water.

Wetlands

The brief project summary provided by NCDOT does not indicate whether wetlands impacts will occur. A Water Quality Certification will be required if a Section 404 permit is required by the US Army Corps of Engineers. A prequisite to issuance of the certification will be assurances that NCDOT has followed the Clean Water Act's 404(b)(1) guidelines and that mitigation, if necessary, is appropriate. In this regard, the EA should clearly delineate the boundaries and provide a description of the type(s) of wetlands and values that may be impacted by this project. It should be noted that sediment control and wetland avoidance do not constitute mitigation for impacted wetlands.

We appreciate the opportunity to provide comments on this project during the planning phase. Please contact Mr. Alan Clark if you have any questions. (733-5083)

RECEIVED

JUL 25 1990

90650

~~[illegible]~~ HCC
Cobb

RECEIVED
1990
DIVISION OF HIGHWAYS
PLANNING & RESEARCH BRANCH

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

June 28, 1990

IN REPLY REFER TO
Planning Division

Mr. L. J. Ward, P.E., Manager
Planning and Research Branch
Division of Highways
North Carolina Department
of Transportation
Post Office Box 25201
Raleigh, North Carolina 27611-5201

Dear Mr. Ward:

We have reviewed your letter of May 29, 1990, requesting information for a "Federal Environmental Assessment for NC 49 from the Existing 4-lane Section Near UNCC to 1000 Feet East of SR 1300 in Harrisburg, Mecklenburg and Cabarrus Counties, State Project No. 8.1672601, Federal-Aid No. F-28-1(4), TIP No. R-2215" and offer the following comments.

Department of the Army permit authorization, pursuant to Section 404 of the Clean Water Act of 1977, as amended, will be required for the discharge of excavated or fill material in waters of the United States or any adjacent and/or isolated wetlands in conjunction with this project, including disposal of construction debris. We anticipate that the proposed work will probably be covered by Nationwide Permit No. 26 (33 CFR 330.5(a)(26)). When final plans are completed, including the extent and location of any work within waters of the United States and wetlands, our Regulatory Branch would appreciate the opportunity to review these plans for a project-specific determination of Department of the Army permit requirements. Should you have any questions, please contact Mr. Steve Lund, Regulatory Branch, at (704) 259-0857.

We appreciate the opportunity to comment on this project. If we can be of further assistance to you, please do not hesitate to contact us.

Sincerely,

Lawrence W. Saunders
Chief, Planning Division

RECEIVED
JUL 25 1990

State of North Carolina
Department of Environment, Health, and Natural Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Douglas G. Lewis
Director
Planning and Assessment

JUL 1990
RECEIVED
SECRETARY'S OFFICE
DOA

MEMORANDUM

TO: Chrys Baggett
State Clearinghouse

FROM: Melba McGee
Project Review Coordinator

RE: 90-0950 - Scoping - NC 49, Mecklenburg County

DATE: June 28, 1990

The Department of Environment, Health, and Natural Resources has reviewed the proposed scoping notice. As a result of this review, our divisions have identified minor and major concerns the Department of Transportation (DOT) should be aware of and adequately address in future environmental documents. Particular attention should be given to hiring a qualified biologist to conduct a field survey detecting the locations of rare plant species. DOT should also be reminded that if wetlands are involved, a clear explanation of how they intend to avoid or mitigate should be fully addressed.

Thank you for the opportunity to comment.

MM:bb

Attachments

RECEIVED
JUL 25 1990

P.O. Box 27687 Raleigh, North Carolina 27611-7687 Telephone 919-733-6376

cc: [illegible]

JUL 1990

North Carolina Department of Cultural Resources

James G. Martin, Governor
Patric Dorsey, Secretary

Division of Archives and History
William S. Price, Jr., Director

June 28, 1990

MEMORANDUM

TO: L. J. Ward, P.E., Manager
Planning and Environmental Branch
Division of Highways
Department of Transportation

FROM: David Brook, Deputy State
Historic Preservation Officer David Brook

SUBJECT: Improvements to NC 49 from UNCC to
Harrisburg, R-2215, Mecklenburg County,
CH 90-E-4220-0950, ER 90-7889

This project has been previously reviewed. According to our letter of March 12, 1990 (copy attached), we were awaiting test results for site 31Mk417 and recommended no further work be conducted within the proposed 100-foot by 4.2-mile project area. These comments remain in effect and we will anticipate reviewing the report of testing for site 31Mk417.

We will also wait for the historic architectural resources survey report to comment on historic architectural resources.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Ms. Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

DB:slw

Enclosure

cc: State Clearinghouse

RECEIVED
JUL 25 1990

COPY — NCDOT

506 To
SC-1 [illegible]

~~Elmer C. Vick~~
Cobb
cc: KY
7-26-90

CHARLOTTE

JUL 03 1990
DIV. OF HIGHWAYS
PLANNING & RESEARCH BRANCH

June 28, 1990

Mr. L. J. Ward, P.E.
Planning & Research Branch Manager
North Carolina Department of Transportation
P.O. Box 25201
Raleigh, NC 27611-5201

Subject: NC 49 Widening, UNC at Charlotte to Harrisburg,
T.I.P. #R-2215, Cabarrus and Mecklenburg Counties

Dear Jack:

We have the following comments regarding the subject project within Mecklenburg County:

1) Local transportation staff supports the four-lane, median-divided facility concept. However, we feel that due to the rapid urbanization of the area a strong possibility exists for seven traffic signals between UNCC's main entrance and Oak Leigh Drive, a distance of approximately two miles. With this in mind, a more urban cross-section with a narrower median should be considered that has a lower design speed, thus taking less right-of-way.

2) No median opening should be provided at the NC 49/Old Concord Road intersection because southbound traffic on NC 49 destined for Old Concord Road can use Mallard Creek Church Road. This could potentially eliminate the need for a traffic signal between Mallard Creek Church Road and the proposed Eastern Circumferential Road which will cross NC 49 approximately 800'-1000' east of Old Concord Road. It is our hope that the circumferential road will be constructed between NC 49 and Mallard Creek Church Road as part of the Mallard Creek Church Road widening project.

3) The present proposal to realign Harris Houston Road with the existing Back Creek Church Road/NC 49 intersection is expected to be implemented as scheduled in advance of the NC 49 Widening project.

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Department of Transportation
600 East Fourth Street Charlotte, NC 28202-2858 704/336-2261

4) An alignment for the Harrisburg Bypass was approved by the Charlotte-Mecklenburg Metropolitan Planning Organization (MPO) in September 1987. A portion of the right-of-way has also been reserved. If projected traffic volumes warrant it, there should be a review of whether the Bypass should be constructed in lieu of the improvements through Harrisburg, or whether it should remain on both the Charlotte-Mecklenburg and Harrisburg Thoroughfare Plans.

Local transportation staff will continue to assist the consultant and NCDOT on all efforts regarding this project. If you have questions concerning our comments, contact Mr. Bill Coxe with the Mecklenburg County Engineering Department at (704) 336-3745 or Mr. Timothy Gibbs with the Charlotte Department of Transportation at (704) 336-3917.

Sincerely,

R. N. Pressley, Jr., P.E., Chairman
Technical Coordinating Committee

RNPjr/TDG:mdp

cc: W. B. Finger
L. O. Purnell
W. S. Coxe
J. T. Lesch

90GS [illegible]
[illegible]

United States Department of the Interior
FISH AND WILDLIFE SERVICE
ASHEVILLE FIELD OFFICE
100 OTIS STREET, ROOM 224
ASHEVILLE, NORTH CAROLINA 28801

TAKE PRIDE IN AMERICA

~~Vick~~
Elmore
~~[illegible]~~
Cobb

cc. Ky
R Eckelstein } 1/2

July 5, 1990

Mr. L. J. Ward, P.E.
Manager, Planning and Research Branch
North Carolina Department of Transportation
P.O. Box 25201
Raleigh, North Carolina 27611-5201

Dear Mr. Ward:

Subject: Proposed upgrading of NC 49 from the existing 4-lane section near the University of North Carolina at Charlotte to 1,000 feet east of SR 1300 in Harrisburg, Cabarrus, and Mecklenburg Counties, North Carolina (State Project No. 8.1672601, Federal Aid No. F-28-1(4), TIP No. R-2215)

This responds to your letter of May 29, 1990 (received June 4, 1990), requesting our comments on the subject proposal. These comments are provided in accordance with the provisions of the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and Section 7 of the Endangered Species Act, as amended (16 U.S.C. 1531-1543).

Based on our records, Helianthus schweinitzii (Schweinitz' sunflower), a plant species currently proposed for Federal listing as endangered, may occur within the impact area of the proposed action. In accordance with Section 7 of the Endangered Species Act, if it is determined that the proposed project is likely to jeopardize the continued existence of this species, a conference must be initiated with this office. In addition to H. schweinitzii, the U.S. Fish and Wildlife Service (Service) is concerned about potential impacts the project may have on stream and wetland ecosystems within the project impact area. Preference should be given to alternative alignments, stream crossing structures, and construction techniques that avoid and/or minimize encroachment and impacts to these resources.

The Service's review of any environmental document would be greatly facilitated if the document contained the following information:

(1) A complete analysis and comparison of all available alternatives including the no action alternative.

(2) A description of the fishery and wildlife resources within existing and required additional rights-of-way and any

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areas, such as borrow areas, which may be affected directly or indirectly by the proposed improvements.

(3) Acreage and descriptions of branches, creeks, streams, rivers, or wetlands which will be filled as a consequence of proposed highway improvements. Wetlands affected by the proposed project should be mapped in accordance with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

(4) Linear feet of any water courses which will be relocated as a consequence of the proposed improvements.

(5) Acreage of upland habitats, by cover type, which will be eliminated as a consequence of proposed highway improvements.

(6) Techniques which will be employed for designing and constructing any relocated stream channels or for creating replacement wetlands.

(7) Description of all expected secondary and cumulative environmental impacts associated with this proposed work.

(8) Mitigation measures which will be employed to avoid, eliminate, reduce, or compensate for habitat value losses associated with any of the proposed improvements.

We appreciate the opportunity to provide these comments and request that you continue to keep us apprised on the progress of this project. If you have any questions, please contact Mr. John Fridell at 704/259-0321 or FTS 672-0321. In any future correspondence concerning this project, please reference our log number 4-2-90-070.

Sincerely,

Brian P. Cole

Brian P. Cole
Field Supervisor

cc:
Section Manager, North Carolina Wildlife Resources Commission, Archdale Building, 512 N. Salisbury Street, Raleigh, NC 27611
Mr. Charles Roe, Director, North Carolina Natural Heritage Program, P.O. Box 27687, Raleigh, NC 27611
North Carolina Department of Agriculture, Plant Conservation Program, P.O. Box 27647, Raleigh, NC 27611
Division Administrator, Federal Highway Administration, Box 26806, Raleigh, NC 27611
Field Supervisor, FWS, P.O. Box 33726, Raleigh, NC 27636-3726

CC.KY 8.3.90

Jack Ward, Manager
Planning and Research
Room 462, Hwy Building

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P. O. BOX 25201
RALEIGH 27611-5201

AMES G. MARTIN
GOVERNOR

THOMAS J. HARRELSON
SECRETARY

July 16, 1990

MEMORANDUM TO: L. J. Ward, P. E., Planning and Research

FROM: Curtis B. Yates, Bicycle Coordinator Curt

SUBJECT: Federal Environment Assessment for NC 49 from the existing 4-lane section near UNCC to 1000 feet east of SR 1300 in Harrisburg, Mecklenburg and Cabarrus Counties, State Project No. 8.1672601, Federal-Aid No. F-28-1(4), TIP No. R-2215

In your memorandum of May 29, 1990, you requested our comments regarding the proposed improvements to NC 49 in Mecklenburg County.

The Mecklenburg County Parks and Recreation Department has plans for a greenway along Toby Creek which will intersect NC 49 in the vicinity of Harris Boulevard. The NCDOT has already constructed a short section of asphalt path along NC 49 as it crosses under Harris Boulevard, in order to provide continuity for this proposed Toby Creek greenway. Although this joint use greenway path will not directly intersect the section of NC 49 to be widened as part of R-2215, the path will be an attractor for bicycle traffic coming in along NC 49 from as far north and east as Harrisburg. In addition, since project R-2215 is in the vicinity of UNCC, college students commuting by bicycle will ride along NC 49 as they travel between the university and residential areas.

For these reasons, we request that bicyclists' needs be considered during the planning and design phase of R-2215. Specifically, we ask that consideration be given to the following option:

- Widened curb lanes. The provision of widened outside lanes (13' - 14' as opposed to 12') can better accommodate both bicyclists and motor vehicles in the same lane.

We appreciate the opportunity to comment on the above named projects. Please feel free to contact us again regarding this or any other bicycle related matter.

CBY/jc

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CABARRUS COUNTY
PLANNING DEPARTMENT
Post Office Box 707
CONCORD, NORTH CAROLINA 28025

9/6 [illegible]
sent
CC: KY 8/8/90

~~Wickel~~ Freer.
~~Tice~~
Cobb
Rozendaal

July 26, 1990

Mr. L.J. Ward, P.E.
NCDOT
Planning & Research Branch
Post Office Box 25201
Raleigh, North Carolina 27611-5201

Ref: N.C. 49 at Cabarrus/Mecklenburg County line TIP Number R-2215

Dear Mr. Ward:

Your letter dated May 29, 1990, requested comment on the proposed project listed above.

This project will provide an improved traffic flow on a portion on N.C. 49, and should not result in any negative environmental impact.

The County is in favor of this project, and if NCDOT or PAI Associates needs any help at the local level, please let us know.

Yours truly,

Michael L. Byrd
Michael L. Byrd
Planning & Zoning Department

MLB/pcc

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